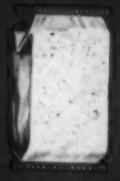
PIT AND QUARRY

DEPENDABLE as a source... DEPENDABLE as a service

KRAFT BAG MADE-TO-ORDER HEAVY-DUTY



MULTI-WALL SHIPPING SACKS

2 to 6 ply plain or printed 1 to 4 colors

Custom-made to fit your specific needs, Kraft Bag Multi-Wall Shipping Sacks render full value in service—deliver full value to your customers... flexible in filling, rugged in handling, tough in transit, they empty c-l-e-a-n, with less dusting or sifting!

3 GENERATIONS OF BAG SPECIALISTS

SELF-CONTAINED • SELF-SUSTAINING

producing our own pulp and paper and other components in our own integrated plants, at Gilman, Vt. and St. Marys, Ga.

There is no substitute for kraft!

Gilman PAPER CO.

KRAFT BAG CORPORATION

KRAFT BAG CORPORATION

GILMAN PAPER COMPANY SUBSIDIARY

630 Fifth Avenue, New York 20, N.Y.

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If your product fits into a bag — we'll make the bag to fit your product.

6 YEARS' SERVICE-

3,500,000-plus tons *and* *still* *going* *strong*!

When the G.T.M.—Goodyear Technical Man—was called in to specify a conveyor belt for this asphalt mixing plant, wartime demand prevented redesign of the loader to eliminate too-close clearance which was grinding sharp, abrasive rock into the belt.

In spite of the belt-killing abrasion, the Goodyear Style B conveyor belt he installed has been going strong in service which would have quickly destroyed most belts—more proof that Goodyear's design-for-the-job means outstanding conveyor belt service.

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

We think you'll like "THE GREATEST STORY EVER TOLD" Every Sunday — ABC Network

GOODYEAR

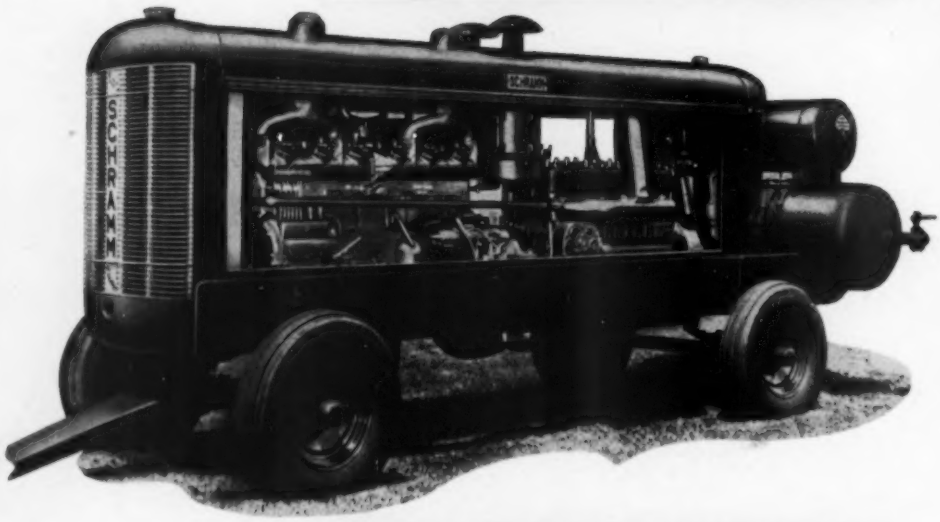
THE GREATEST NAME IN RUBBER

PIT AND QUARRY, November, 1952, Vol. 45, No. 5, Published monthly by the Complete Service Publishing Company, 431 South Dearborn Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and posessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

SCHRAMM

MODEL 600

Diesel Engine Driven Air Compressor



Fuel Savings Up To 50%

Pneumastat, simple and rugged . . . Proper Speeds . . . Less horsepower required . . . Cam operated mechanical intake valves, greater volumetric efficiency. There you have some of the many features in the new Schramm Model 600 Air Compressor . . . features that mean economy while supplying you with 600 cubic feet actual air delivery.

SIMPLIFIED DESIGN

You will like its streamlined, simplified design, too—fewer parts . . . watercooled enabling operation with doors closed . . . Dual fan belts . . . Engine and compressor speeds designed to operate at maximum Diesel Engine efficiency.

Don't delay. Write today for Bulletin SPB-51.

SCHRAMM INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

HOW THE EASTON SIDE-DUMP IDEA CAN MEET YOUR EXACT REQUIREMENTS!

To double your capacity for a long off-highway haul you might want to hitch a dump trailer to a dump truck. How could the front unit dump *except* to the side? It *couldn't* dump any other way!

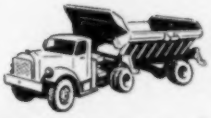
When the containers dump to the side *any* combination of units is possible. Side-dump *flexibility* lets you plan a haulage fleet to meet your exact requirements, regardless of load, speed, grade or distance. That's why you see so many *different* EASTON side-dump combinations in off-highway service!

Also, with every EASTON side-dump, you eliminate the need for costly backing and turning at the dumping point. You roll up, dump, and roll on. Your driver *sees where he is going* at all times!

For real haulage economy remember that EASTON side-dumps may be used with any make of off-highway truck or tractor. For specific side-dump recommendations write to the address below.

A FEW VARIATIONS OF THE EASTON SIDE-DUMP IDEA:

These and other EASTON side-dump combinations, with capacities ranging from 14 to 45 tons, are providing a smooth economical flow of material in mines, quarries and other off-highway hauling operations throughout the world. EASTON engineers will welcome the opportunity to discuss the application of side-dump truck bodies and trailers to meet your specific haulage requirements.



Pan Type Trailer for big payloads to a fixed point in shuttle service over moderate grades.

Drop Door Trailer, hydraulic dump, for big payloads over moderate grades, dumping at any point.

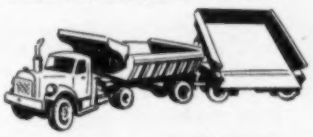
Pan Type Truck Body for shuttle service to a fixed point on grade work against the load.

Drop Door Truck Body with drop door trailer, hydraulic dump, for big payloads over long hauls. Back mounted body provides extra traction.

Dual Bodied Trailer, pan type, for big payloads to a fixed point, each body dumping separately.

Drop Door Truck Body hydraulic dump, for versatile all-around hauling, free dumping at any point.

Lift Door Truck Body for heavy loads against steep grades to a fixed dumping point.



Drop Door Tandem Trailer, hydraulic dump, for extra large payload, long haul over fairly level roads, dumping at any point.

Drop Door Trailer with gooseneck frame, hydraulic dump, for versatile all-around hauling, free dumping at any point.

Pan Type Tandem Trailer for extra large capacity over long distance with fairly level roads.

Pan Type Truck Body with pan type trailer, for large payload to a fixed dumping point with back mounted body providing extra traction.

B-1054

EASTON SIDE-DUMPS

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

Investigate

THE IMPROVED McLANAHAN

Bantam Buster

SINGLE ROLL CRUSHER

WITH CUT FABRICATED STEEL FRAME GEARS, ANTI-FRICTION ROLLER BEARINGS, SEGMENT ROLLS AND RENEWABLE CRUSHING PLATE TIPS

for Crushing

Coke, Lime, Coal, Salt, Alum and Similar Materials

For low initial cost and exceptional economy of operation, standardize on the McLanahan Bantam Buster Crusher. With its high ratio of reduction and rugged construction throughout, it produces a constantly uniform product of desired size—from ¾″ up for market requirements.

In operation, the material to be crushed is fed into the hopper where high teeth on the roll crack the large lumps and low teeth break the smaller pieces to required sizes. These crushers are available in three basic sizes: 18″ in diameter up to 48″ wide, and 24″ and 30″ in diameter up to 60″ wide.

The Bantam Buster can be choke fed through a hopper . . . or used in conjunction with a McLanahan Reciprocating Plate Feeder.

Write for your copy of Bulletin BB-5112 Today!

This new bulletin includes technical details, dimensional drawings and a table showing capacity-horsepower data for the various roll lengths and various size products.

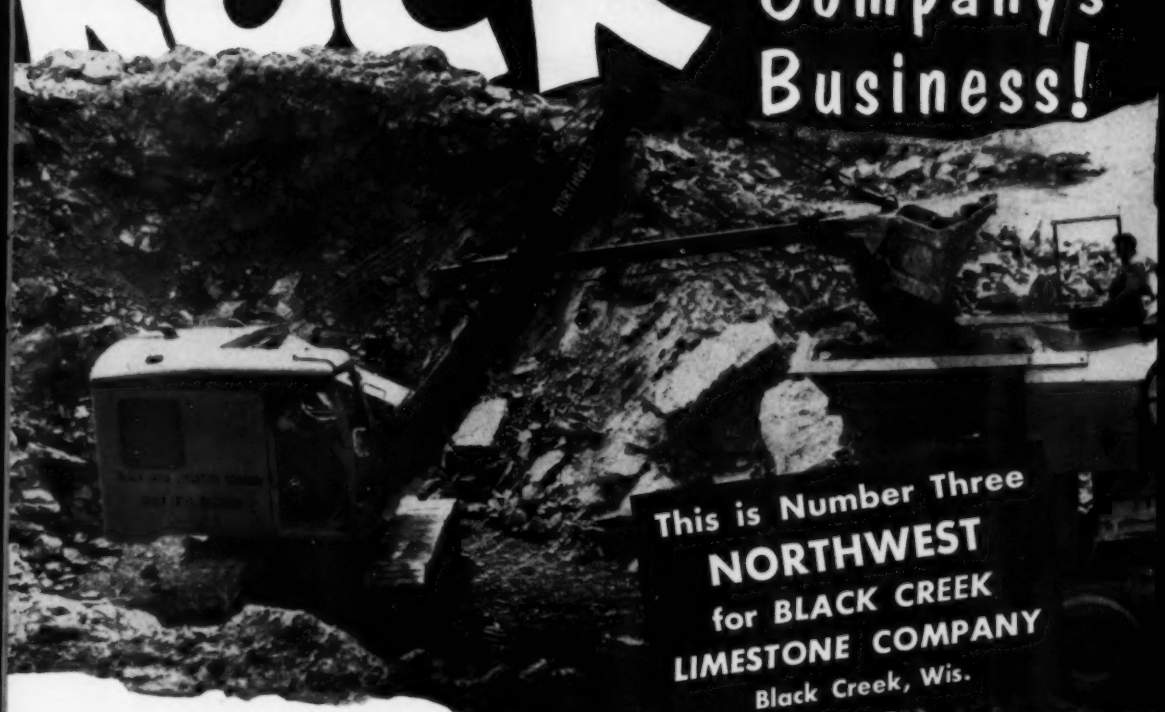
McLANAHAN & STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835

Hollidaysburg, Pennsylvania

Dependable Products! Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Feeders, Ball Grinders, Conveyors, Elevators, Screens, Scrubbers, Steel Log Washers, Sand Dryers, Hoists, Jigs, Dry Pans, Dryers, Scrap Bundlers, Pulleys, Gears, Bearings, Sprockets, Sheaves, Rollers, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Furrows and Bronze Castings.

ROCK is this Company's Business!



—and the rock plant is the company's factory. Any situation like that needs dependability on the "feeding" end and that is why a new Northwest 3/4 yd. shovel is there in the pit.

This is the third Northwest that Black Creek Limestone Company has owned so they knew they were getting dependability when they installed it. They had proved Northwests in their own rock so to speak.

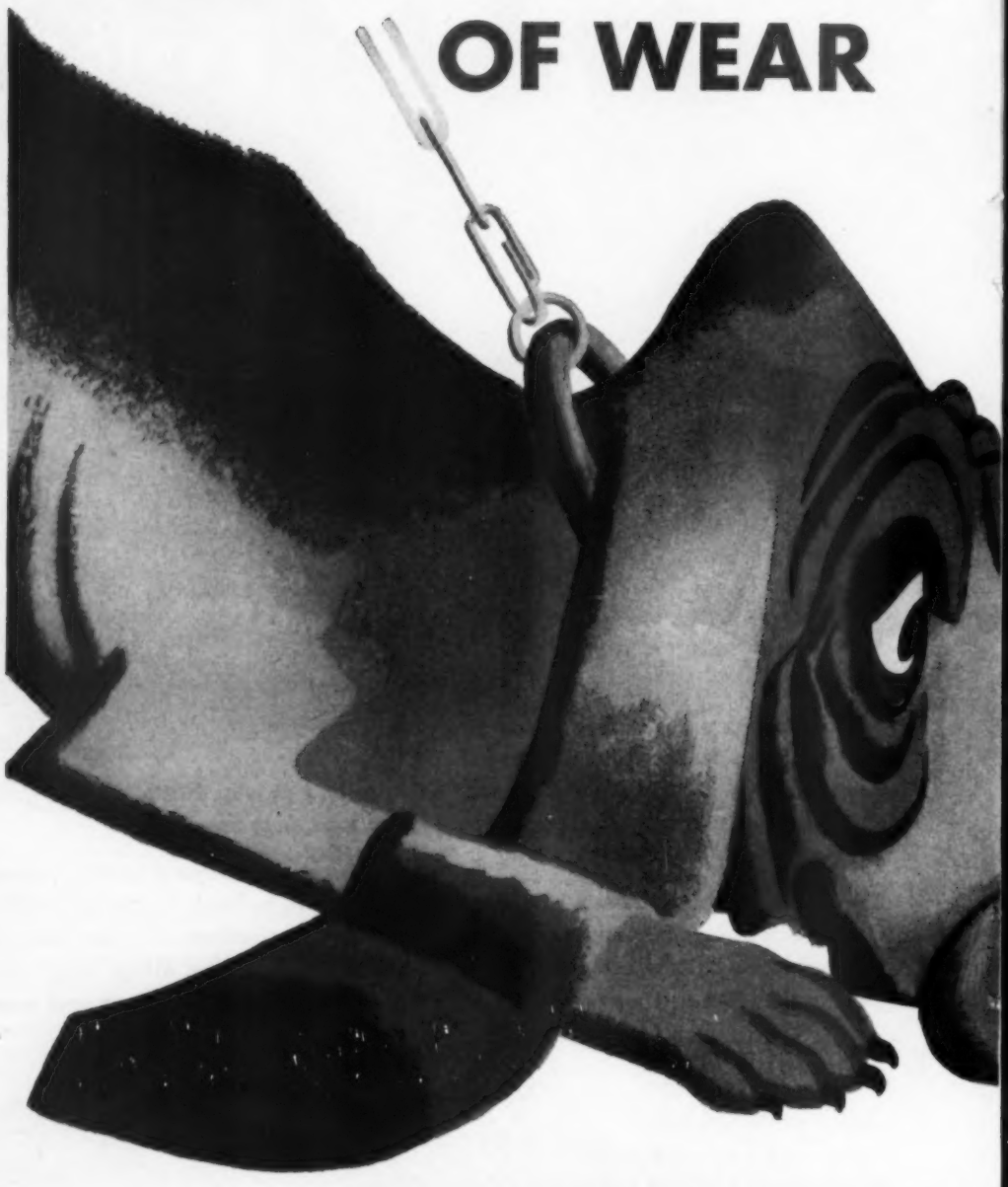
Northwest advantages are worth having and it pays to bank on the successful experience of others. Why not plan on a Northwest? Learn about them now and talk it over with a Northwest man.

NORTHWEST ENGINEERING COMPANY
1515 Field Building • 135 South LaSalle Street • Chicago 3, Illinois

NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem

"HOT" ON THE TRAIL OF WEAR



DELVAC OILS

THE FLYING RED HORSE COMPANIES:

Pit and Quarry

New Radio-Active Tracer Tests Prove Delvac Oils' New Super-Detergent Formula Cuts Engine Wear—Lowers Oil Consumption

FROM TESTS with radio-active tracers taken from the atomic pile at Oak Ridge comes the proof:

Delvac Oils with new super-detergent formula sharply reduce wear during low-temperature operation *when most wear occurs* . . . during starts and warm-ups and stop-go operation. Less engine wear means longer engine life, fewer overhauls – lower fuel and oil consumption, too!

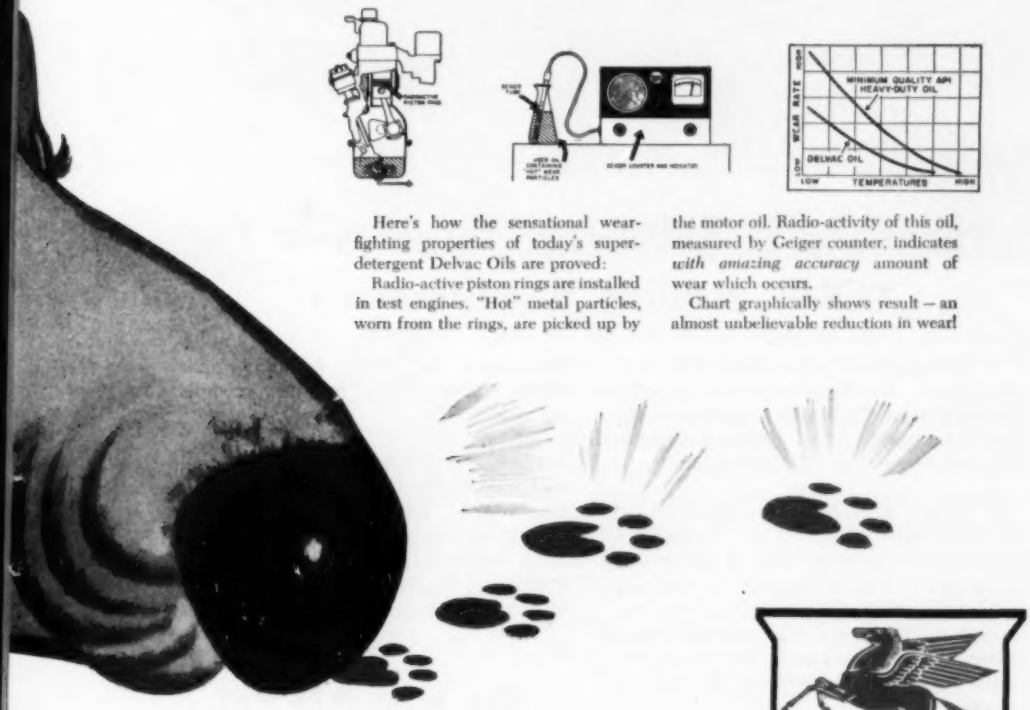
For additional protection, Delvac Oils also provide other outstanding performance qualities. They resist oxidation and foaming, guard against corrosion, minimize formation of varnish, lacquer, sludge. They help your engines develop full power – help keep maintenance costs at rock bottom!

Call your Socony-Vacuum representative today for these improved, super-detergent Delvac Oils. They are recommended or approved by 125 of the country's leading engine and equipment builders.

Here's how the sensational wear-fighting properties of today's super-detergent Delvac Oils are proved:

Radio-active piston rings are installed in test engines. "Hot" metal particles, worn from the rings, are picked up by the motor oil. Radio-activity of this oil, measured by Geiger counter, indicates *with amazing accuracy* amount of wear which occurs.

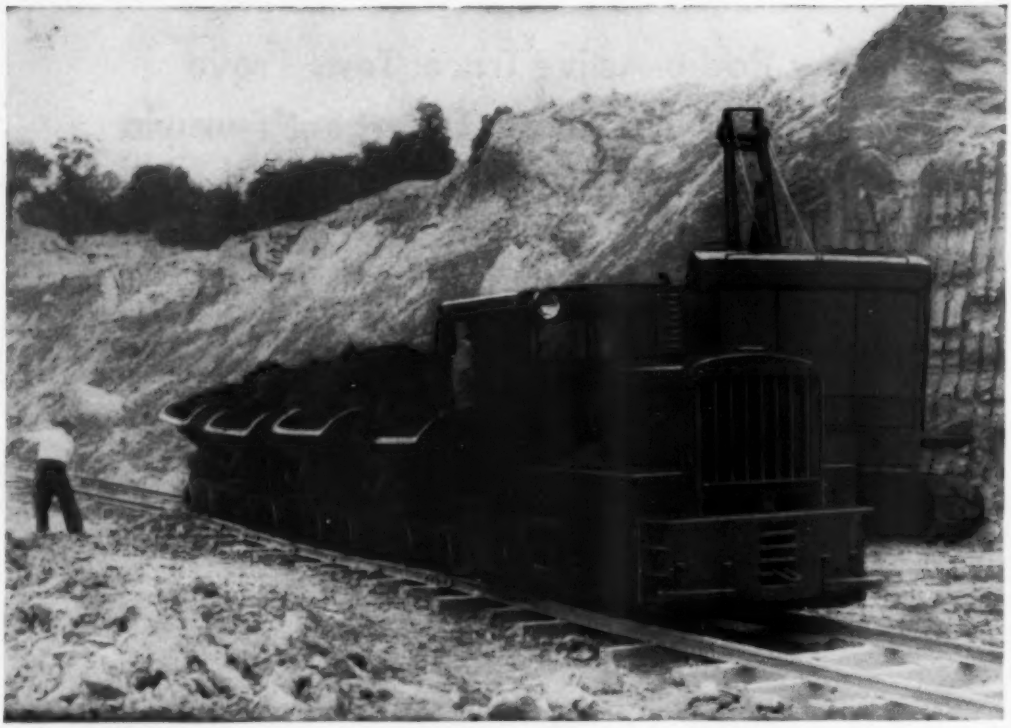
Chart graphically shows result – an almost unbelievable reduction in wear!



Correct Lubrication for Contractors

SOCONY-VACUUM

SOCONY-VACUUM OIL CO., INC., MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.



There's a PLYMOUTH Locomotive For YOUR Hauling Requirements!

The *right* locomotive provides *more* than just power. An efficient switcher supplies the right power for the job, handles easily, runs economically, and operates dependably for years with little maintenance.

The 8-ton diesel-powered PLYMOUTH pictured above, operated by a large brick manufacturer in New York, is just one of a complete line of rugged locomotives, engineered for efficient, cost-cutting performance. Numerous reports indicate that company after company has found the right PLYMOUTH Locomotive to meets its needs.

Whether you need a 3-ton or 70-ton model or any size in between . . . standard or narrow gauge . . . gas, diesel, or diesel-electric power, there's a PLYMOUTH Locomotive for YOUR hauling requirements. Send today for new complete catalog.

Every Plymouth Locomotive can be equipped with Plymouth's new Hydraulic Torque Converter for amazing handling ease and smooth operation. Write for information now! PLYMOUTH LOCOMOTIVE WORKS, Division of The Fate-Root-Heath Company, Dept. A-15, Plymouth, Ohio.

PLYMOUTH LOCOMOTIVES

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

no axe to grind

Since Torrington makes every basic type of anti-friction bearings, our engineers are able to make impartial recommendations for the type best suited to your needs.

Perhaps your application calls for spherical roller bearings. Maybe tapered roller, straight roller, ball or needle bearings are what you need. Or, Torrington can design a special bearing, tailored to your requirements.

In short, whatever your friction problem, there's a Torrington bearing to solve it. Why not ask us to help you?

THE TORRINGTON COMPANY

South Bend 21, Ind. Torrington, Conn.

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TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

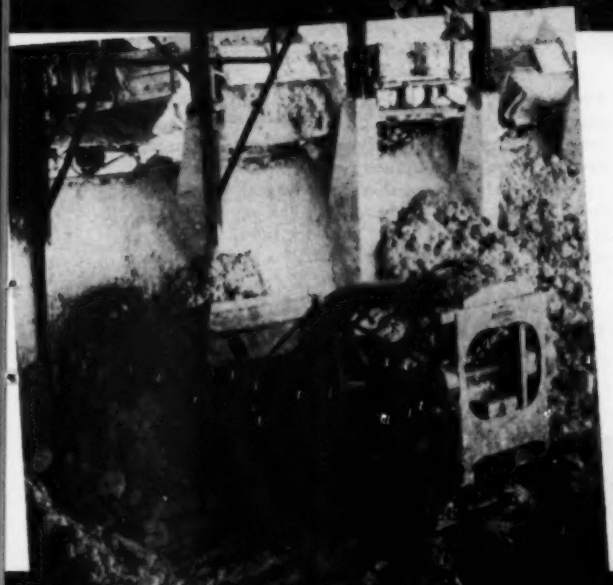
SIMPLICITY helps build the Garrison Dam

Two Simplicity Gyrating Screens in operation at the Becker County Sand and Gravel Company in Detroit Lakes, Minnesota, are helping to produce fine aggregate for the Garrison Dam project located 40 miles away. The first Simplicity Screen is a 5′ x 12′ Double Deck Scalper that works in closed circuit with the crushers. The second is a 5′ x 12′ Triple Deck Simplicity Screen that feeds minus 3/16″ material to the hydraulic classifier and the dewaterer. These Simplicity Screens are doing a splendid job for Becker because Simplicity's famous gyrating action gives them fast, accurate sizing at a low operating cost. For complete information on Simplicity equipment, consult a Simplicity sales engineer or write us today.

111

Sales Representatives in all parts of the U.S.A.
FOR CANADA: Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario
FOR EXPORT: Brown and Sites, 50 Church Street, New York 7, N. Y.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND, MICHIGAN



STOCK PILE LOADING

Loading clay with an Eimco 104 at a Southern clay operation has averaged 800 tons per shift for the better part of a year.

The clay material discharges easily and leaves the bucket clean.

This typical Eimco 104 loading job is repeated on many other types of material; rock, sand and gravel.

For economical, fast loading investigate Eimco loaders first.

EIMCO A409

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment

EXECUTIVE OFFICES AND FACTORIES · SALT LAKE CITY 10 · UTAH · U. S. A.

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IN ITALY EIMCO ITALIA S P A MILAN ITALY

You Can't Beat an Eimco

"Enough" was sometimes too little

when weighed on this crude balance centuries ago. The need for greater accuracy brought the modern scales which easily measure the weight of a pencil mark.

Traylor Rotary Kilns enjoy a world-wide reputation for QUALITY production as well as efficient, dependable operation. Each kiln is designed to fit the job it will do. Traylor Bulletin 115 gives complete construction details.

Today, accuracy of *quality* as well as quantity is necessary in all phases of production to assure success in business. For 50 years, Traylor engineers have pioneered equipment that offers complete control of job processes in order to deliver a uniform, high quality product. It takes experience to satisfy modern demands of the rock products industry. Traylor has experience . . . half a century of it.

TRAYLOR ENGINEERING & MANUFACTURING CO.
1456 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York, Chicago, San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

a **Traylor** *leads to greater profits*

Look at the production

27¢

buys

One hundred and seven times each hour, this busy, hustling Lorain Shovel turns and disgorges one ton of limestone into trucks. Coolly and efficiently the "Caterpillar" D318 Diesel Engine that powers this shovel works in limestone dust, rain and heat, until at the end of an 8-hour day 850 tons of limestone have been loaded.

That's powerful production, but what does it cost? To get *more than 100 tons* of limestone an hour, the Diesel uses only *27 cents' worth of fuel.* That's because "Cat" Engines use low-cost, non-premium fuel—without fouling. No wonder then that the owners, Columbia Rock Products Corp., Columbia, Tenn., say:

" 'Caterpillar' equipment is tops for quarry work, excavating and grading, and mining phosphate. Our old gas-engine-powered shovel used 50 gallons of gasoline a day against 16 gallons of fuel oil used by the 'Caterpillar' D318 Engine."

The "Cat"-powered shovel works in a one-acre quarry, 50 feet deep. It operates on four different levels. Rock is shot every other day.

Besides the D318, Columbia Rock owns this other "Caterpillar" equipment: another "Cat" Diesel to power a second Lorain Shovel; a D6 Tractor, and a motor grader.

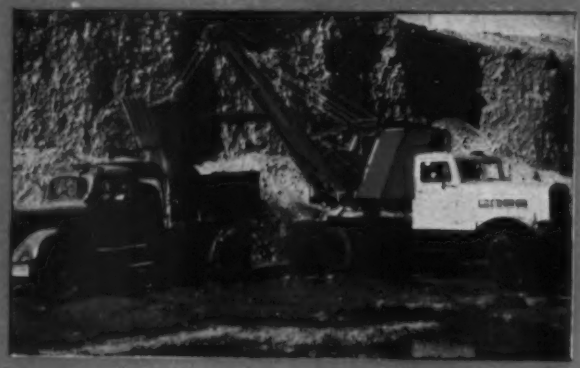
Hard-working, economical "Caterpillar" Engines, up to 500 horsepower, are available in machines made by leading equipment manufacturers. Let your "Caterpillar" Dealer show you engines that will lower your costs and boost your production and profit.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



"QUICK-WAY"

Reg. U.S. Pat. Off.

Speeds Output Increases Profits for PIT AND QUARRY OPERATORS

Whether its moving shot rock, sand, or crushed stone, stripping overburden or charging bins, you'll find the "QUICK-WAY" in a class by itself in the ¼ to ½ yard field.

The "QUICK-WAY" features low center of gravity, works easily over the side, has proper balance for truck operation, gives you easy, fast swinging, plenty of reserve power, rugged all steel construction, numerous parts interchangeable. 4 models, ¼ to ½ cubic yard shovel, clamshell, dragline, backhoe, 3 to 10 ton crane capacity. Truck speeds to and from jobs. Low initial cost. Low maintenance costs. Eight different attachments.

With a "QUICK-WAY" you'll roll up yardage records hour after hour, day after day. Ask your distributor for a free demonstration or mail coupon.

"QUICK-WAY" Model E dragline with 30' boom loading gravel

Clinker is handled from the pit to the storage pile and from the storage pile to grinding circuit with a mobile "QUICK-WAY" crane

"QUICK-WAY" truck shovel, loading sand

"QUICK-WAY"
TRUCK SHOVEL CO.
Denver, Colorado, U.S.A.

"QUICK-WAY" crane with skull cracker attachment eliminates secondary shooting

MAIL COUPON TODAY

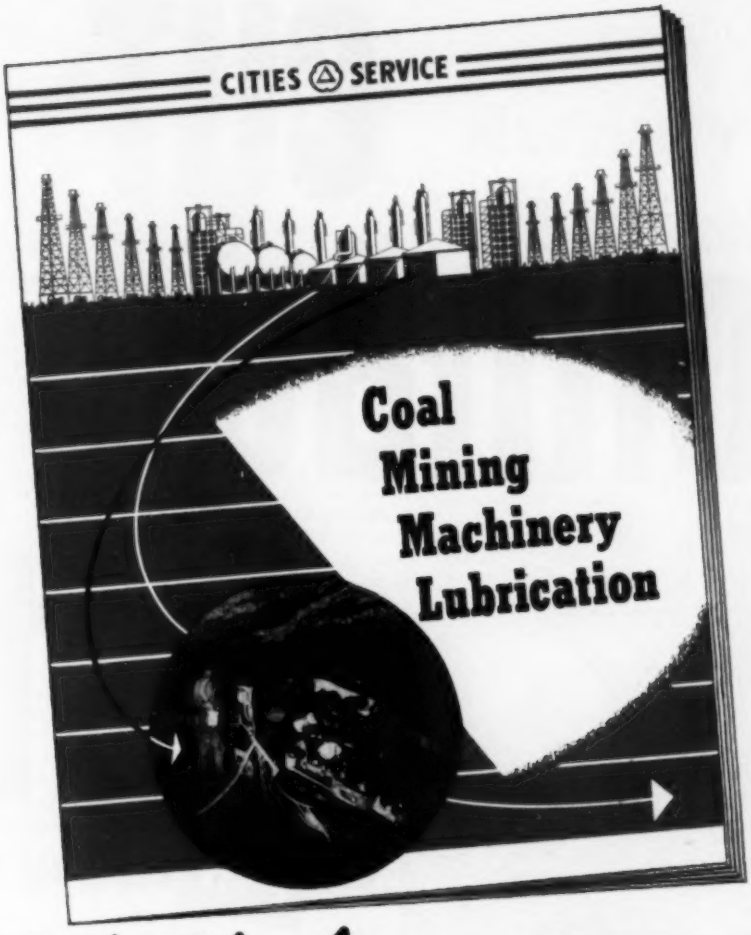
"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 97 • 2401 East 40th Ave. • Denver 1, Colorado

Please send me complete details on "QUICK-WAY" Truck Shovels —four different models from 3 to 10 ton crane capacity.

Name _____

Address _____

City _____ State _____



Write Today for your FREE copy

TODAY, MORE THAN EVER BEFORE, THIS LUBRICATION BOOK CAN PROVE EXTREMELY USEFUL IN EVERY MINING OPERATION

This new Cities Service Lubrication Book offers lubrication recommendations for every type of mining machinery . . . everything from drills, cutters and loaders to wire rope and ventilating fans.

It includes a complete lubrication chart for all mining machinery. Invaluable! . . . especially when training new personnel.

Head man or beginner in *any* mining operation . . . you'll want this book not only for vital, specific lubricating recommendations and procedures, but also for the general information contained on the make-up and function of the complete line of high quality Cities Service oils and greases. FOR YOUR FREE COPY, write Cities Service Oil Company, Dept. K21, Sixty Wall Tower, New York City 5.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

cut tonnage costs

with P&H ELECTRIC SHOVELS

In more and more locations these ultra-modern P&H machines are taking over the jobs that call for big production — steady digging. Users who know their cost accounting come back for more — for one proved reason . . . *lower tonnage costs.*

Contributing factors are these:

P&H Magnetorque® Hoist Drive powers hoisting motions electro-magnetically, gives you snappier dipper action — eliminates hoist generator, slip friction clutch and other troublesome mechanical devices.

P&H stepless power regulation is smooth and accurate — with no control fingers or contactors to give you trouble.

Independent propel, all-welded construction, filtered air cab and other modern refinements have led the way to more dependable production on a year-in, year-out basis.

If you seek lower tonnage costs in open pit work, let us tell you where you can see a P&H Electric Shovel in action. Ask about a P&H today.

®T.M. of Harnischfeger Corporation for electro-magnetic type clutch

Every third P&H Electric Shovel sold is a repeat order

HARNISCHFEGER
CORPORATION

4400 West National Ave. • Milwaukee 46, Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Machinery and Equipment *in use the world over!*

Experience gained in almost a half-century of designing, engineering and manufacturing machinery, used in leading plants the world over, is reflected in the dependability and economy of operation which distinguishes all KVS products. Flow charts and maintenance records compiled in the operation of many different plants equipped with KVS machinery and equipment show an unvarying *decrease* in production costs and a uniform *increase* in output.

The KVS plant at Danville, Pa., provides unrivalled manufacturing facilities. Over 20 acres of floor space under the cranes, equipped with the most modern machinery and engineering facilities in the world, is devoted exclusively to the manufacture of crushing and mining equipment for Lime and Cement plants plus steam generating plants designed to provide maximum power for processing a wide variety of materials and products.

Gyratory crushers
(Double Discharge Outlets)
Primary & Secondary

Swing Jaw Crushers
(Jaws reversible, end-to-end)

Slugger Rolls
(Available in single roll models)

Stratified Air Swept Tube Mills

Preheaters, Soaking pits, Deheaters

Rotary kilns, Coolers, Dryers
(sectional lengths & diameters)

Rod, Ball & Tube Mills

Vibrating Screens
(One, Two or Three decks)

Heavy-Duty Rock Feeders
(Kennedy Overlapping Pans)

Disc & Twin Screw Feeders

Apron Feeders & Conveyors

Heavy-duty & Exhaust Fans

Cyclone Collectors

Turbines — Boilers

Waste Heat
Boiler Installations

Pneumatic Transport Pumps

Air Activated Containers

For transporting cement and other pulverized materials by rail, motor truck or within the plant. Send for special bulletin.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION ***manufacture everything from a crusher to complete Lime, Cement and Mining Plants and Steam Generating Equipment.***

SEE INSIDE

Send for bulletins describing all KVS machinery and equipment. Let us prove "It Costs Less To Own The Best".

IT COSTS LESS.. TO OWN THE BEST!

KENNEDY - VAN SAUN
MANUFACTURING & ENGINEERING CORPORATION
TWO PARK AVENUE, NEW YORK
FACTORY DANVILLE, PA.

AGAIN— KENNEDY PRESENTS AN INNOVATION IN CRUSHING EQUIPMENT!

NEW Gyratory Crusher with Dual Discharge Outlets Increases Output and Efficiency

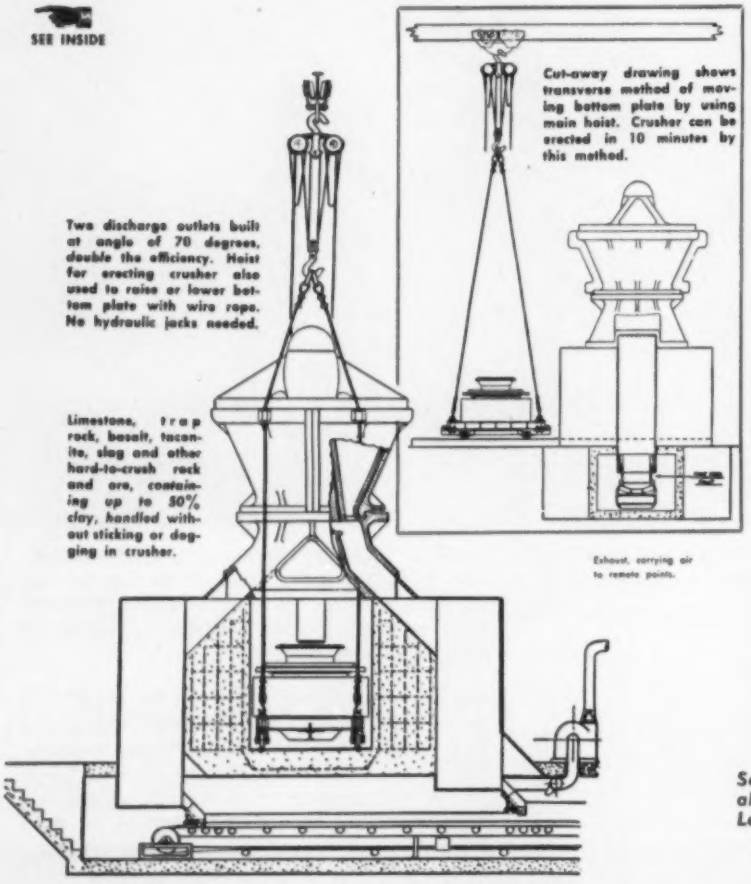
Only KENNEDY has the correct answer to the "Sticky Ore" problem! KENNEDY Gearless Gyratory Crushers are now built with TWO DISCHARGE OUTLETS plus an exclusive "No-Stick" feature that increases efficiency and output. This distinct innovation in crusher design is another "FIRST" for the world-famous line of KENNEDY crushing equipment.

Hard-to-crush rock and ore such as limestone, trap rock, basalt, taconite, slag, etc., containing as high as 50% clay, can be handled without sticking or clogging by the exclusive KVS process.

No other crusher offers this advantage. Double discharge outlets, built at angle of 70 degrees, assure uninterrupted delivery of material. Other crushers, with single 42 degree outlets, cannot compare because the discharge outlet becomes clogged with sticky clay or taconite ore.

In the new KVS crushers, rock and ore pass through mantle and concaves at bottom. A vertical drop of 6 feet then quickly and surely disgorges sticky clay, etc. — greatly speeds production by eliminating clogging — saves countless man hours clearing stalled crushers.

SEE INSIDE


Cut-away drawing shows transverse method of moving bottom plate by using main hoist. Crusher can be erected in 10 minutes by this method.
Two discharge outlets built at angle of 70 degrees, double the efficiency. Hoist for erecting crusher also used to raise or lower bottom plate with wire rope. No hydraulic jacks needed.
Limestone, trap rock, basalt, taconite, slag and other hard-to-crush rock and ore, containing up to 50% clay, handled without sticking or dogging in crusher.
Exhaust, carrying air to remote points.

CHECK THESE FEATURES!

- **Synchronous motor built into pulley assembly**
- **Smooth frictionless operation because the crusher is gearless**
- **Power used ONLY for crushing**
- **All moving parts carried on self - aligning roller bearings**
- **KVS forced - feed oiling system pumps four barrels of oil per hour through bearings without waste**
- **Eccentric and ball are spray babbited. NONE has been rebabbitted in over three years**

Send for bulletins describing all types of KVS crushers. Let us prove that "It Costs Less To Own The Best".

FARRELL-CHEEK

HARD EDGE WHEELS

LONGER SERVICE ON THE JOB

ALWAYS MORE ECONOMICAL

Finest Name in Cast Steel!

FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Chaker Hooks, Bar Benders, Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

• • • SANDUSKY, OHIO U.S.A.

WHEN DIGGING'S TOUGH, THIS DIPPER'S TOUGHER

How service and manganese steel are cast and welded into **AMSCO** Dippers

More than 5,000,000 cubic yards of rock and abrasive materials have been dredged by one AMSCO All-Manganese Steel Dipper similar to this 1¾-yard model —and the end of its service is nowhere in sight!

Service like this is expected—and considered normal—by users of AMSCO Dippers. Just as users throughout all industry know that AMSCO Manganese Steel Products mean service and long life wherever impact and abrasion must be controlled. AMSCO Manganese Steel has the unique quality of actually becoming harder with use, acquiring a high surface polish to shrug off grinding abrasion, while retaining body metal toughness.

Made *entirely* of "The Toughest Steel Known," AMSCO Manganese Steel Dippers use no rivets, but are fabricated by the modern, streamlining Plug-Welding method that permanently interlocks cast segments. AMSCO All-Manganese Steel Dippers are available in two-piece welded, three-piece renewable lip, and Missabi designs—or can be adapted to your unusual materials handling specifications. Also available in sizes to fit all power shovels.

Check these additional PLUS features:

- **One-piece Manganese Steel back casting.**
- **Top and bottom have cast-in, double-wall box-sections for *maximum strength, minimum weight.***
- **Cast-in pin connecting lugs for handle, back, braces, bail.**
- **Bail is a one-piece casting with elongated tubular cross-section, for strength and lightness.**
- **Teeth are set for clean, fast digging.**
- **Interior is smooth and slightly tapered for free dumping.**

Contact your shovel manufacturer about AMSCO Dippers, or write AMSCO, Chicago Heights, Illinois.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

396 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.

Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.

The Right Way to Start

One tenth of a second lost at the starting line can cost a runner the race. It's important that he knows the right way to start, that he gets under way properly without any lost motion. It's just as important that engines are protected—the right way—from the very beginning.

Rusciano and Son Corp. are contractors in New York City. They operate everything from cranes to Cats. Long ago they found out that Winslow protection was cutting operational costs, lessening breakdowns and causing longer periods between engine overhauls.

Now they specify Winslow oil conditioners as original installations on all their engine-driven equipment. Rusciano and Son know that the right way to start engine protection is with Winslow.

Winslow Filters and Elements have been protecting industry for over a quarter of a century. Their performance is guaranteed by the famous Winslow warranty, your assurance of the finest protection your engines can have.

WINSLOW FILTERS

Winslow Engineering Company 4069 Hollis Street • Oakland 8, California

Announcing the NEW Commander

ANOTHER Cedarapids PRODUCT

FOR HIGHER PERCENTAGES OF SECONDARY CRUSHING AND GREATER SCREENING CAPACITY

LARGER ROLL CRUSHER

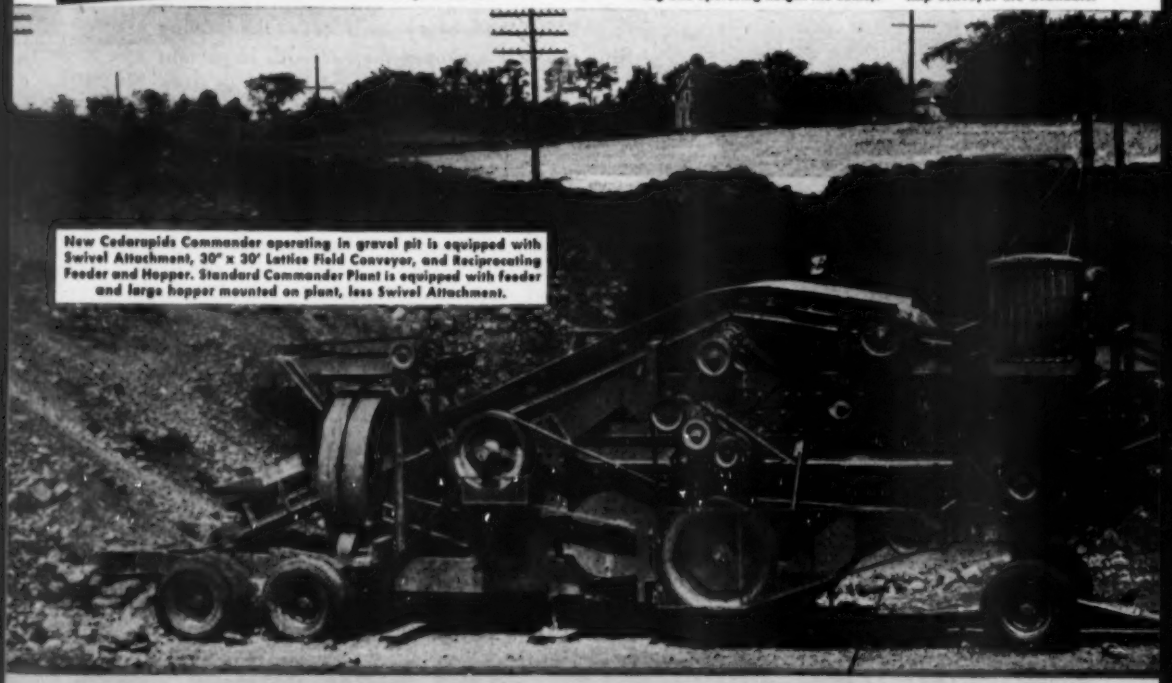
The 30"x 22" Roll Crusher in the new Commander increases secondary crushing capacity by approximately 50% for the producer who needs greater output, or whose pit conditions put a bigger load on the secondary crusher. Heavy-duty construction features include: Smooth or corrugated manganese steel roll shells; Timken tapered roller bearings for maximum long wear and economical operation; Finger timing gears of chrome molybdenum and heavy chrome vanadium steel; Helical tension springs; Easy roll shell opening adjustment. Cedarapids patented safety shear plates prevent crusher damage from uncrushable foreign material.

LARGER SCREEN

The big 48" x 10' Screen on the Commander Plant gives you 30% more screening capacity! This, plus the more efficient screening action and the *extra* capacity of all Cedarapids Horizontal Vibrating Screens, assure big volume output of accurately graded aggregate. The top deck feeding principle used on Cedarapids Plants also increases capacity by eliminating any possible choke point. By making an immediate split of the pit material, the circulating load on crushers, belts and screens is reduced and the output of the plant is not limited by the capacity of the jaw crusher. Lower over-all head room* equired (traveling and operating height the same).

LARGER CONVEYORS

The feed conveyor, delivery conveyors and under-crusher conveyor on the Cedarapids Commander have been widened to 30" to handle the increased capacity of this plant. The channel frame conveyors combine light weight with exceptional strength. Pulley shafts are fitted with sealed anti-friction bearings. The idler ball bearings are sealed for life. These belt conveyors are ideal for Commander Plants because they are built for continuous, efficient service under the toughest working conditions. As optional equipment, an 18" x 18' sand conveyor and an 18" x 27' chip conveyor are available.



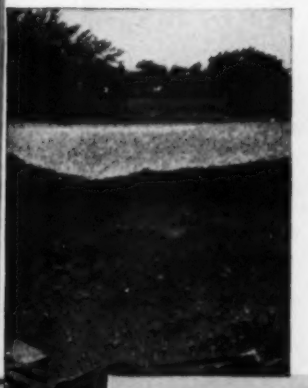
New Cedarapids Commander operating in gravel pit is equipped with Swivel Attachment, 30" x 30' Lattice Field Conveyor, and Reciprocating Feeder and Hopper. Standard Commander Plant is equipped with feeder and large hopper mounted on plant, less Swivel Attachment.

THE **IOWA** LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

. . . PORTABLE CRUSHING AND SCREENING PLANT!

HERE'S a brand new gravel crushing and screening plant designed specifically to meet the demand for *much greater tonnages of fine-crushed products.* The Cedarapids Commander has approximately the same over-all dimensions as the popular Cedarapids Junior Tandem, but it contains a *bigger* Roll Crusher, a *larger* Horizontal Vibrating Screen and *wider* Conveyors to handle the increased capacity. More secondary crushing and greater screening capacity give you a big advantage in any pit, but are especially profitable where there is a high percentage of pit material to be crushed.

The Commander's big-volume output is combined with extreme portability and flexibility to handle a wide range of crushing and screening conditions . . . *and you get the same low maintenance and operating costs that are standard in the Junior Tandem!* It adds up to a pleasant profit picture in today's booming aggregate market. Find out about *all* the many new Commander features that help you command the market, the bidding, the pit conditions and the profit potential on every job. See your Cedarapids distributor today.



. . . and a host of other big-production features . . .

- **Swivel Feed Attachment (optional) to drive 30" x 30' lattice frame feed conveyor (as shown in picture).**
- **30" Reciprocating Feeder and Hopper, clutch controlled from operator's platform or ground, assure a steady, workable flow of material. A weight-loaded metering gate regulates the feeding for properly balanced plant operation.**
- **75" x 22" Elevating Wheel Return System makes the Commander shorter and narrower for easier transportation, and speeds handling of material from crushers to screen.**
- **Sand Ejector Screw, 12" diameter and 4' long, is used under the screen for discharging sand onto the sand conveyor. Optional equipment.**
- **The Commander is easily converted into a high capacity rock plant by using a Cedarapids 2236 AAA or 2540 AAAA Portable Primary ahead of it.**
- **Highly portable for easy moving from pit to pit. Fast set-up and take-down minimize lost time between jobs.**

It's another reason why so many contractors BUY CEDARAPIDS!

The development of new products to meet the constantly increasing demands for greater production of specification aggregate with no increase in operating and maintenance costs, is still another reason why more and more aggregate producers *Buy Cedarapids.*

Cedarapids equipment is produced in such a wide range of sizes and types, and designed for such a wide variety of work that selection of the proper machine for your specific job is no problem . . . and you are sure of getting equipment which is as modern and efficient as constant engineering research and precision methods of manufacture can make it. Iowa fully understands the needs of producers because Iowa Engineers keep in close contact with the problems of the field.

IOWA MANUFACTURING COMPANY

CEDAR RAPIDS, IOWA, U.S.A.

POWER TRANSMISSION

PHILADELPHIA
WORM GEAR
SPEED REDUCERS

For right angle drives—horizontal or vertical. Ratings to 250 h.p. Ratios 3½:1 to 6300:1

GEARS

All types, sizes and materials

PHILADELPHIA
HERRINGBONE
SPEED REDUCERS

Single, double, triple reductions. Ratios 1.75:1 to 300:1. High efficienties.

Literature describing these products will be sent upon request.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

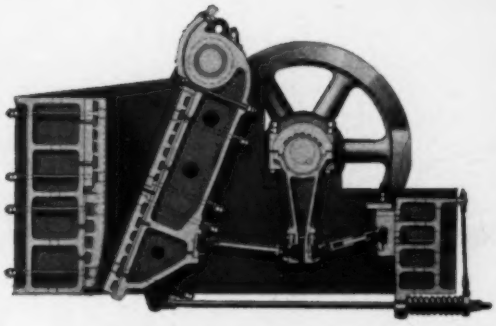
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

DRY ROLLING TOGGLES ON A-C JAW CRUSHERS

Last 4 to 6 Times as Long

AS OLD TYPE JAW CRUSHER TOGGLES!

ALLIS-CHALMERS
Jaw Crushers



FROM A ROCK AND SAND PLANT...
Dry toggles installed 2½ years ago still going strong!

FROM A CEMENT PLANT...
After more than 2 years' operation, dry rolling toggles show relatively no wear!

FROM A MINING COMPANY...
New dry rolling toggles last 3 months, operating 24 hours a day. Old toggles lasted only 1 to 3 weeks!

FROM A QUARRY OPERATOR...
Dry rolling toggles installed 2½ years ago show very little wear.

Users names on request.

ACTUAL FIELD REPORTS show Allis-Chalmers dry rolling toggles (which are still in use) have already lasted *up to six times* as long as conventional toggles. No wonder crushing men are enthusiastic!

True rolling action of toggle ends and seats — instead of damaging sliding action — results in much less wear. Friction is eliminated — toggle ends operate cold even after a day's crushing.

Maintenance is less, too. No lubrication is required. Toggle ends operate dry. It's safer and cleaner around the crusher because there are no oil lines, no messy oil drip.

For more facts, get in touch with the Allis-Chalmers representative in your area, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

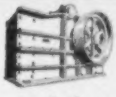
A-3824

ALLIS-CHALMERS

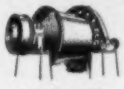
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Hammermills

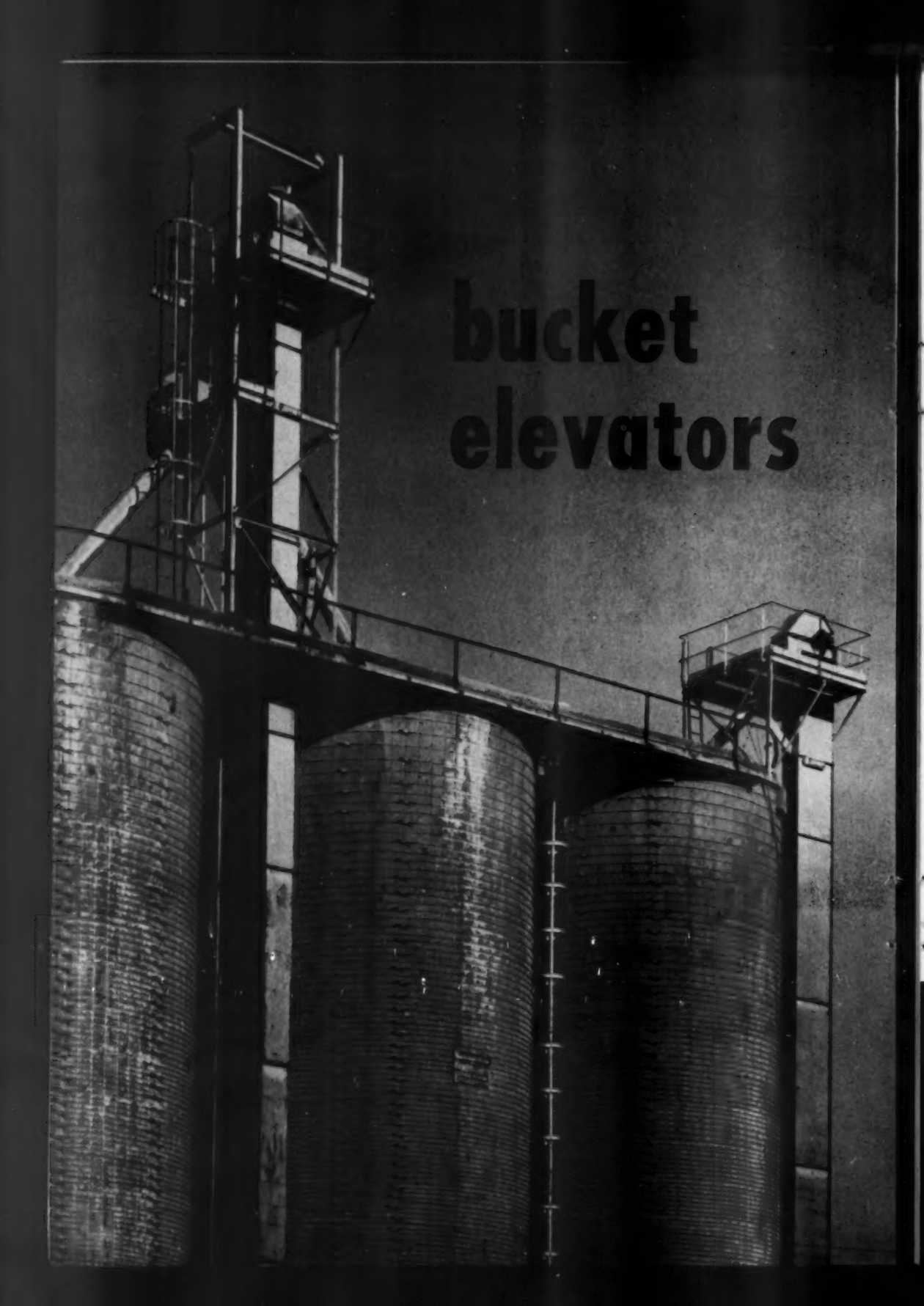
Vibrating Screens


Jaw Crushers

Gyratory Crushers


Grinding Mills

Kilns, Coolers, Dryers


bucket
elevators

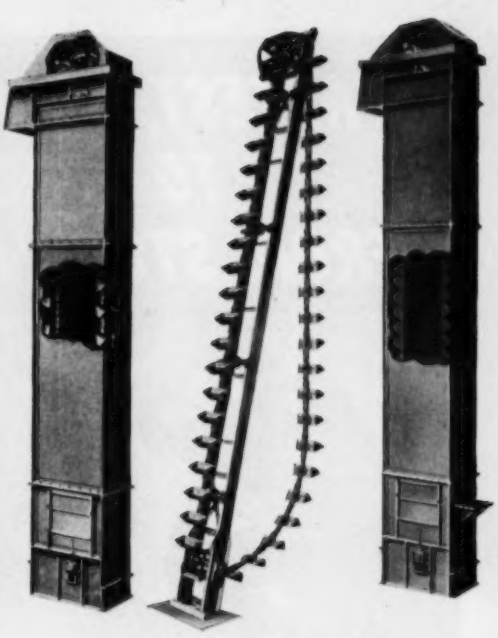
STANDARDIZED

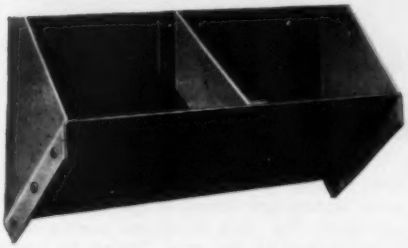
A Type and Size to Meet Most Requirements

Complete Drawings Available

Special Designs for Unusual Applications

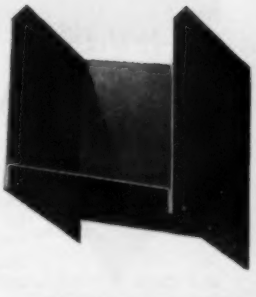
BACKED by { ***YEARS OF EXPERIENCE*** / ***SCORES OF APPLICATIONS*** }





A continuous type bucket is shown above. Jeffrey Bucket Elevators have many improved features: welded angle casings, dust and weather tight, removable hood, increased bearing protection, large inspection doors and others. Let us tell you more about them.

Yes, Jeffrey Bucket Elevators have been STANDARDIZED — to SAVE you money, time and the expense of making layouts. Types include: centrifugal discharge, positive discharge, continuous bucket, super-capacity continuous, and the inclined centrifugal or continuous . . . mounted on chain or belt with Malleable Iron, Supermal or Steel Buckets. A few types are shown on this page.



JEFFREY

1877 75 1952

FASTEST, EASIEST WAY TO LOAD MATERIAL FROM STOCK PILE INTO TRUCKS

BARBER-GREENE BUCKET LOADERS

No other machine, no other method can equal the speed and efficiency of Barber-Greene Bucket Loaders in loading sand, gravel, and other similar bulk materials from stock piles and storage areas into trucks. At rates up to 3 cubic yards per minute, these loaders dig, lift and convey bulk material in one continuous high capacity flow, virtually eliminating truck waiting and driver waiting time. Simple to operate, easy to understand. The truck driver can operate the loader to load his own truck. Backed by over 1,000,000 yards of material handled by Barber-Greene Loaders, they represent the ultimate in low-cost loading efficiency.

A TYPE THAT WILL DO YOUR JOB BEST

MODEL 543

This self-propelled loader is mounted on a tractor-type chassis and pneumatic tires for traveling from job to job at rates up to 15 m.p.h. Equipped with a hydraulic swivel conveyor, it has the reach to load highest trucks, long trucks and trailers, and trim the load to full capacity every time. Capacity—3 cubic yards per minute. Easily converted for loading coal or snow.

Send for catalogs!

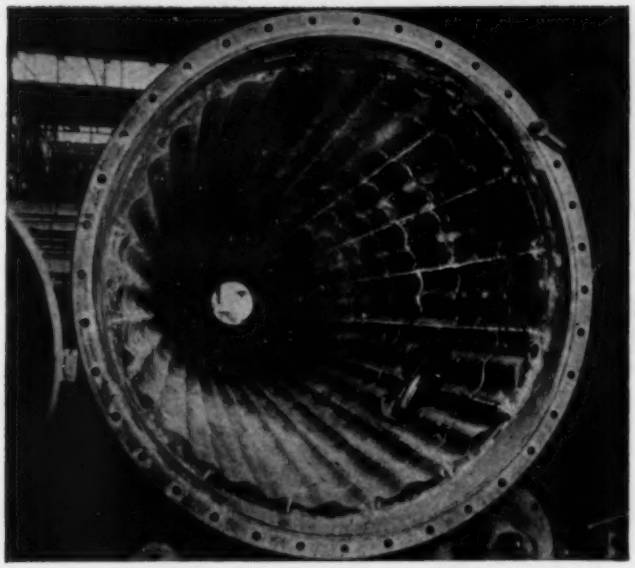
Complete and detailed information on the Model 543 and 82A is contained in individual catalogs available at your request. Ask your Barber-Greene Distributor or write directly to the address below.

MODEL 82A

This crawler-mounted, 3 cubic-yard per-minute Bucket Loader has the stability so often necessary in typical truck loading operations—in pits, on soft or rocky ground, etc. Built for heavy, continuous operations, it is economical enough to justify itself in intermittent service. Complete accessories are available, including single and double deck vibrating screens for loading, screening and scalping simultaneously.

Barber-Greene

Aurora, Illinois, U. S. A.



NI-HARD LINERS . . . cast by Treadwell Engineering Co., Easton, Pa., a prominent source of Ni-Hard castings for the cement industry . . . line this 7' x 26' mill used for wet grinding cement stone. This lining comprises 170 segments, 1¾-3" thick, stress relieved, with a hardness of 600 Brinell.

NI-HARD SOLVES one of cement industry's TOUGHEST PROBLEMS

Originally developed to help the mining industry crush and grind ores, Ni-Hard® is a nickel-chromium white cast iron that has proved to be one of the hardest commercial products of the iron foundry.

Now, the cement industry has discovered the value of Ni-Hard. One of the leading companies specified Ni-Hard liners for the large tube mill shown above, one of three such mills built by Traylor Engineering and Manufacturing Company, Allentown, Pa. And recently, the same cement company specified Ni-Hard for a considerable number of replacement liner sets for grinding mills in both domestic and foreign service.

You, too, can save labor and cut maintenance costs by using this reasonably priced nickel-chromium iron.

Try it for parts subject to severe wear and abrasion. Castings in practically any design may be produced with Ni-Hard, and it is available from authorized producers, from coast to coast.

GET FULL INFORMATION

Mail the coupon for two booklets. One gives engineering properties and applications . . . the other lists authorized producers of Ni-Hard castings. Use the coupon now.

At the present time, the bulk of nickel produced is being diverted to defense, but nickel is obtainable for the production of Ni-Hard for many end uses in defense and defense supporting industries.

SYMBOL OF INCO SERVICE

The International Nickel Company, Inc.
Dept. PQ, 67 Wall Street, New York 5, N. Y.

Please send me free booklets entitled "Engineering Properties and Application of Ni-Hard" and "Buyers Guide for Ni-Hard Castings."

Name..... Title.....

Company .....

Address .....

City..... State.....

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

to meet defense needs for steel

Kelley Island speeds stripping

Push-loaded by 93 h.p. crawler, "C" packs in 11 to 11½ cu. yds. of loam and low-grade limestone in 75 ft. . . . time, 45 to 60 seconds. After scrapers remove overburden, 6-yd. shovel loads limestone into trucks for delivery to plant. There, material is crushed, screened, and sized for shipment to steel mills.

Material is wasted in this mined-out area. Loads are dumped on the run in about 10 seconds.

C Tournapulls outproduce

Kelley Island Lime & Transport Co., Cleveland, produces several million tons of limestone a year at their Marblehead quarry, Marblehead, Ohio. Their entire output is sold for blast furnace use. To meet today's stepped-up demands, Kelley Island is working two 14-yd. C Tournapulls and one crawler-drawn 15-yd. LP Carryall 16 hours a day, year-around, to strip overburden from scattered limestone beds. Of the 3 scraper units, the 2 Tournapulls are moving 85% of all yardage . . . each "C" accounting for 2¾ times the output of the Carryall behind the crawler! Here's typical production in a pit where overburden averages 12 to 15 inches deep, and the limestone seam, 18 to 20 ft. deep:

38 trips on 2200′ cycle

Push-loaded, each Tournapull gets between 11 and 11½ bank yards of mixed loam and loose, weathered lime-

High-speed, Rubber-tired
Excavating • Hauling
Lifting Equipment

LETOURNEAU LET EQUIPMENT

crawler-scrapers by 175%

Hauling over rough, winding roads and up 1 to 10% grades, Tournapull averages 18 m.p.h. on 2200′ cycle. Constant-mesh transmission with torque converter provides smooth, efficient power at all speeds.

stone rock per load. Cycles of 2200′, including 200′ of 10% adverse grade on approach to dump, are completed in 2¾ minutes. That's 19 trips per 50-minute hour for each "C", and a unit hourly output of 209 to 218 bank yds. Says Mine Superintendent N. D. Shafer, "The Tournapulls have made a great difference on our jobs. With them, we are constantly maintaining new high standards of production."

You be the judge

What Tournapulls are doing for Kelley Island Lime, they can also do for you. Your LeTourneau Distributor will be pleased to show you production figures on the Tournapull best suited to *your* job . . . the 28 m.p.h., 7-yd. Model "D" . . . 30 m.p.h., 14-yd. "C" . . . or 34 m.p.h., 27 or 42-yd. custom-built "A". Call him next time you have a job requiring earthmoving equipment.

Tournapull, Carryall—Trademark Reg. U. S. Pat. Off. P-12-Q

R. G. LeTOURNEAU, INC.
Peoria, Illinois

In Mines and Quarries "EUCS"

HAUL MORE TONS AT LESS COST

Hope to see you at the Denver Mining Show... Be sure to visit space 901 and our big outdoor exhibit at the main entrance.

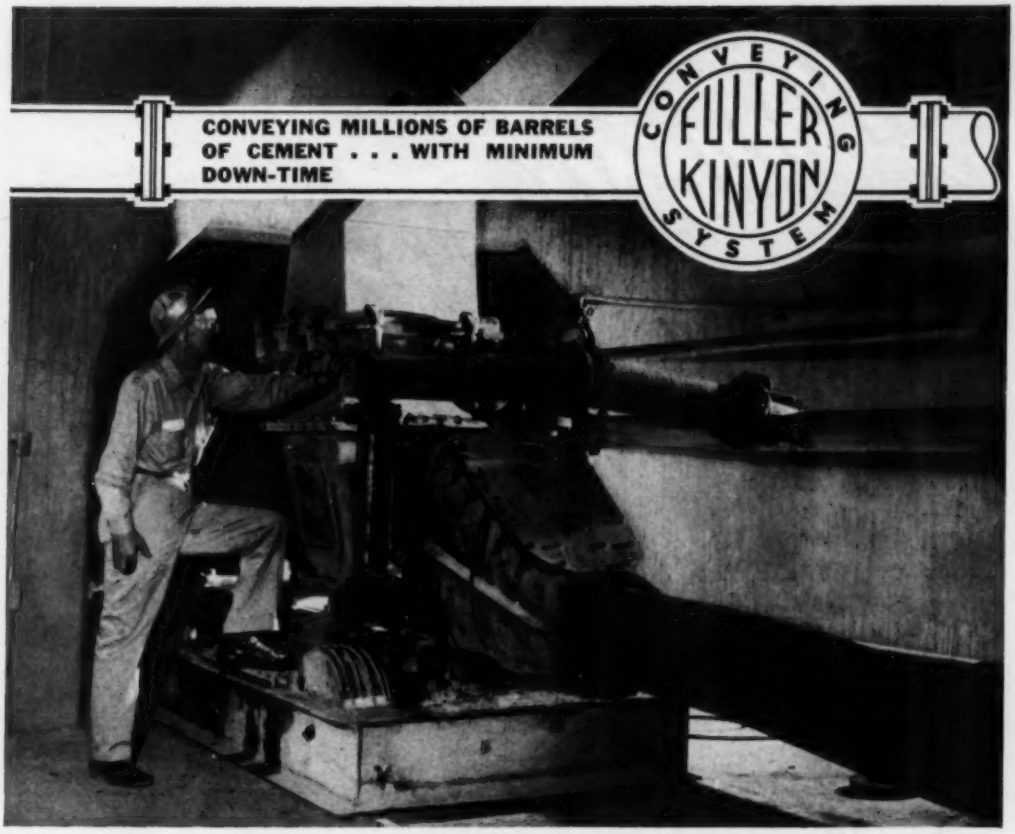
Built for tough off-the-highway hauling, Rear-Dump and Bottom-Dump "Eucs" have stepped up production and cut hauling costs on hundreds of open pit mining and quarry operations.

Euclids have proved their efficiency and long life in hauling a wide variety of materials... coal, ore, rock, overburden and other heavy excavation. Bottom-Dumps are powered by diesel engines of 190 to 300 h.p.... loaded speeds up to 34.4 m.p.h.... available in 20 to 40-ton capacities. Rear-Dump "Eucs" have travel speeds up to 36.3 m.p.h.... powered by diesel engines of 125 to 400 h.p. ... range in capacity from 10 to 34 tons.

Your Euclid Distributor has performance data on jobs similar to yours. Ask him for a Euclid hauling cost estimate — there's no cost or obligation.

The EUCLID ROAD MACHINERY Co. • CLEVELAND 17, OHIO

EUCLIDS



In a bulk-cement storage and shipping plant on the West Coast, two Fuller-Kinyon Portable Pumps (one shown above) are used for conveying bulk cement from trucks to storage silos. These same pumps also convey the cement from the storage silos to ocean-going, cement-carrying ships. Air for conveying is furnished by two Fuller Rotary Duplex Single-stage Compressors, capacity of each 2040 c.f.m., at 40-lb. pressure.

In this particular operation it is highly essential that the Fuller-Kinyon Pumps and Fuller Rotary Compressors operate at highest efficiency at all times, because the wharfage charge is $2.00 for every minute the ships are tied up to the wharf, in addition to operating cost of the ships.

Each pump operated approximately 1100 hours during one year, and this was accompliished with a total emergency shut-down of only one hour and fifty minutes for repairs. Such operation is the result of two very important factors, viz: (1) Equipment designed and built to give satisfactory service under any and all kinds of working conditions; (2) careful overall supervision of the equipment and good housekeeping by the operating crew in the plant.

Fuller-Kinyon Conveying Systems are in operation in hundreds of chemical-processing plants throughout the world, giving day in and day out, 24-hour service, at minimum operating costs. When you have a materials-conveying problem, tell us about it . . . chances are we can show you how to improve your operation.

Write for Bulletin G-1, "4 Basic types of conveying systems built by Fuller".

Fuller

FULLER COMPANY, Catasauqua, Pa.
Chicago 3 • 120 So. LaSalle St.
San Francisco 4 • 420 Chancery Bldg.

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS AND ASSOCIATED EQUIPMENT

P-145

". . . The Head of the Great Rock"

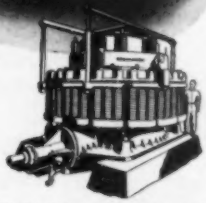
HERE is a bird's-eye view of Penmaenmawr, which means "The Head of the Great Rock", located on the northwest coast of Wales. This dramatic outcrop of igneous rock which forms Penmaenmawr Mountain and the surrounding high land around the town itself, rises abruptly to some 1,400 feet from the edge of the Irish Sea and stands out in marked contrast to the adjoining shore line . . . a familiar mariners' landmark.

Quarries on Penmaenmawr have been worked for over 120 years . . . and it is estimated that there are still 1,000 million tons of stone available for crushing. One company alone is currently producing about 3,000 tons of crushed stone a day . . . and the lion's share of this production passes through five *"SYMONS"* Cone Crushers.

This is just one more example of the leading role that *"SYMONS"* Cone Crushers play in recovering the valuable resources of the earth's surface, in every corner of the globe.

NORDBERG MFG. CO., Milwaukee, Wisconsin

"SYMONS"...A NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD



"SYMONS" Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

Q152

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON • TORONTO

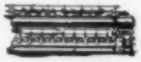
MEXICO, D. F. • LONDON • PARIS • JOHANNESBURG

"SYMONS" Primary Crushers

"SYMONS" Vibrating Bar Grizzlies

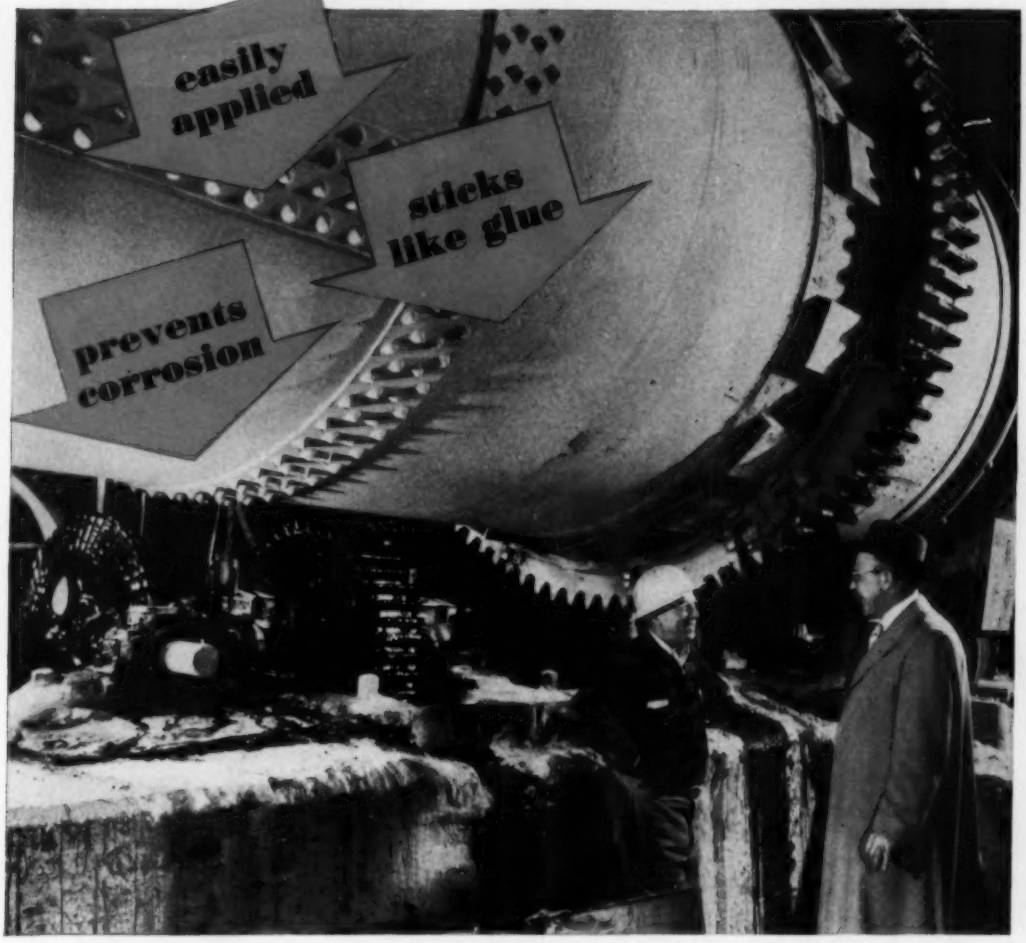
"SYMONS" Vibrating Screens

Grinding Mills



Diesel Engines

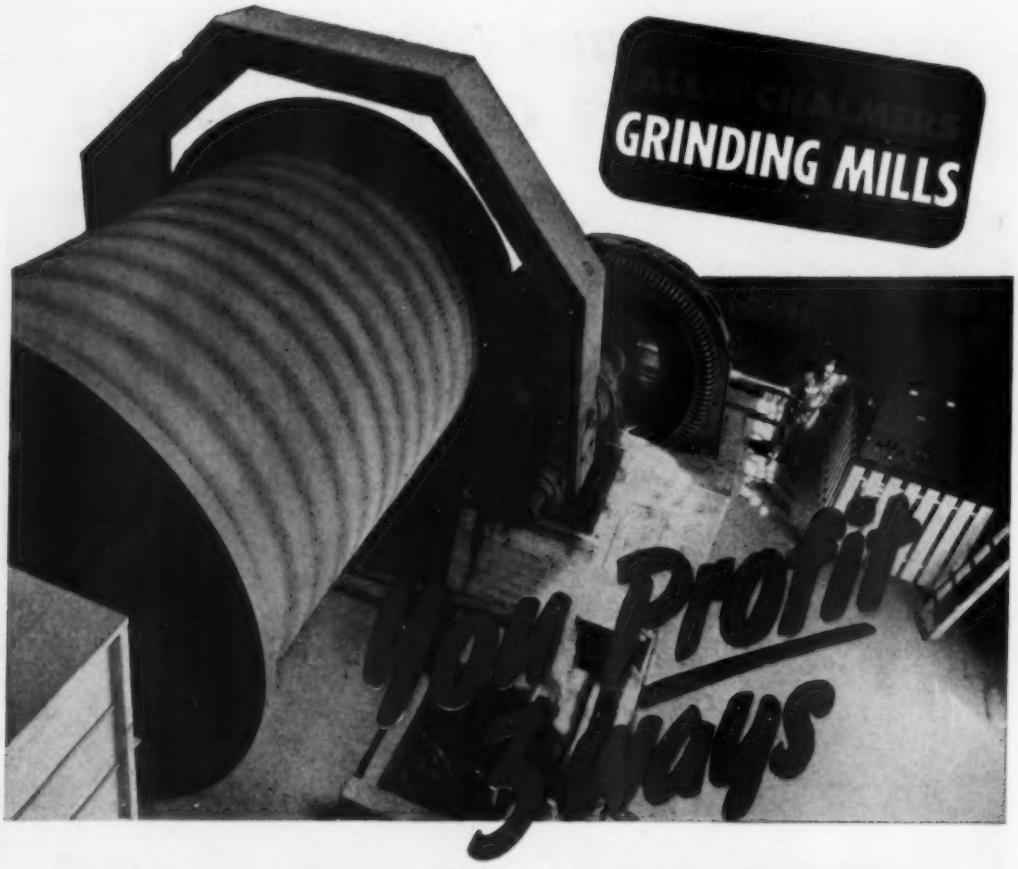
cut maintenance costs with
GULF LUBCOTE!



Gulf Lubcote is the ideal lubricant for open gears in cement plants and quarries. And because it is available in a range of viscosities and consistencies, there is a proper grade for every type of equipment, every operating condition. For additional information on how this quality lubricant can help you reduce lubrication and maintenance costs for open gearing, ask a Gulf Sales Engineer to call. Contact your nearest Gulf office today.

GULF OIL CORPORATION
GULF REFINING COMPANY
PITTSBURGH 30, PA.

GULF INDUSTRIAL LUBRICATION



...WHEN YOU SPECIFY ALLIS-CHALMERS GRINDING MILLS

1 **YOU CAN BE SURE** of getting a grinding mill specifically suited to your requirements. A wide range and multiple combinations of types and sizes assures this . . . assures top, economical performance year in, year out.

2 **YOU GAIN** the seasoned benefits and *unequalled* experience accumulated through the successful installation of more than 4200 Allis-Chalmers mills over a period of 70 years.

3 **YOU ARE DOUBLY ASSURED** of completely balanced operation, with its resulting economies, when you equip your mills with motors, drives and controls — all manufactured in A-C shops.

NEW 44-page grinding mill bulletin 07B6718A is chuck full of valuable tables and grinding mill information. Get it from A-C representative in your area or write Allis-Chalmers, Milwaukee 1, Wis. A-3706

Pulverator is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Pulverator

Gyratory Crushers

Jaw Crushers

Grinding Mills

Vibrating Screens

Kilns, Coolers, Dryers

$115 for service in 5 seasons

--record of rugged K-370 with power hydraulic controls

LOUIS MARSACK & SONS, St. Clair Shores, Mich., load out 2500 yds. of sand and gravel every 8 hours with this 1½-yd. Link-Belt Speeder. In addition to the low service cost above, which excludes engine service—the K-370 provided further savings by replacing two smaller competitive rigs formerly necessary to handle this work. Operator Grant Marsack says, "It's easy to operate, has plenty of power, and needs no adjustments to speak of."

These Link-Belt Speeder PLUS FEATURES mean more output, less cost

Speed-o-Matic Controls — fully hydraulic! You "feel" the load all the way. Simple, easy—fingers instead of muscles do work.

Speed-o-Matic Clutch—hydraulically actuated, simple, smoothly responsive. Runs cool. Eliminates need for frequent adjustments.

Eliminates up to 150 parts — cuts friction, no worn bushings, pins, links or clutch toggles to put you "down."

Service — fast, efficient. Link-Belt Speeder Service is nationwide—near you with replacement parts, factory-trained mechanics.

10,007

LINK-BELT SPEEDER
CORPORATION

Builders of the most complete line of shovels, cranes and draglines

CEDAR RAPIDS, IOWA

SILICA FLINT

CLASSIFY ABRASIVES with

QUARTZ FELDSPAR

RAYMOND
Double Whizzer
SEPARATOR

Special Raymond Separators are providing new concepts for operating and maintenance economy when handling highly abrasive materials.

●

These Separators are specially built for this service with parts most subject to wear constructed of special abrasion resistant alloy castings. In addition the unit is completely lined internally with replaceable steel plate liners.

●

As a result users of these separators tell us that their maintenance and repair expenses when classifying abrasive materials have hit a new low.

●

Raymond Mechanical Air Separators are available with single or double whizzer, as shown, and in commercial sizes from 4 feet to 18 feet in diameter. Also a 30 Inch Separator and a 10 Inch Laboratory Separator.

●

Whatever kind of material you are handling, it will pay you to specify a Raymond Mechanical Air Separator for economical performance.

COMBUSTION ENGINEERING

RAYMOND PULVERIZER DIVISION

1321 North Branch Street Chicago 22, Illinois

RAYMOND *WHIZZER* SEPARATORS

SPECIAL ABRASION-RESISTANT ALLOY CASTINGS

COMPLETELY LINED INTERNALLY

RAYMOND
Single Whizzer SEPARATOR

TYPICAL PRODUCTS

- SILICA SAND*
- SILICATE MATERIALS*
- CEMENT CLINKER
- CEMENT RAW MIX
- HYDRATED LIME
- GYPSUM
- FLINT*
- FELDSPAR*
- QUARTZ*

*Indicates materials for which special construction is recommended.

Write for Raymond Separator Catalog No. 71

-SUPERHEATER, INC.

Sales Offices in Principal Cities

SINCE 1887

the rocks

NOTICE THE FLEXIBILITY of this No. 4, 5,000 volt AMERCLAD Cable. It contains a special crepe paper slipper applied over the conductors to permit easy bending.

HERE ARE the drills that punch out thousands of feet of holes every day. Notice how easily the cable can be coiled around the take-up reels.

THIS AMERCLAD WELDING CABLE is used at the maintenance shop. The 2/0 375 amp. cable is made up of 3,325 individual wires to provide super-flexible operation and ease the strain on the operator's wrists.

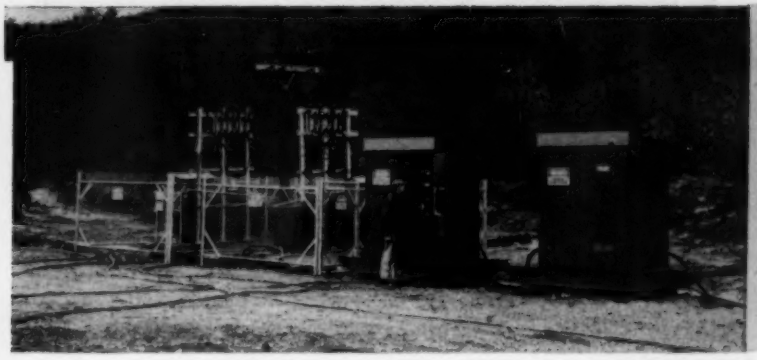
A STANDARD Cable for every

- ▶ paper & varnished cambric cables
- ▶ asbestos cords and cables
- ▶ aerial, underground & submarine cables
- ▶ shovel & dredge cables

AMERICAN STEEL & WIRE DIVISION
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S AMERICAN ELECTRICAL

get so hot you can't touch them but **Amerclad withstands the heat**



THESE ARE TYPICAL switch houses and portable substation at the mine. Average length of cable used is 2,500 feet. The company has been using the original AMERCLAD for 7 years.

ONE of the nation's leading coal producers is stripping an area that is honeycombed with old mines. Many of these mines are burning, some for as long as 20 years. The rocks get so hot that you cannot walk on them or touch them, but miles of U·S·S AMERCLAD lie on the blistering rock without damage. Naturally, the mine operators try to protect the cable, but a lot of it has to lie on the ground.

This mine uses about 11 miles of AMERCLAD heavy-duty portable cable for power shovels and drills. The cable is unavoidably pulled over razor-sharp rock, soaked in acid water and exposed to the direct rays of the sun. In addition, thousands of yards of dirt and rock are blasted every day, and a lot of it comes down hard on the cable.

Despite all this, the AMERCLAD Cable is turning in a fine record of service. *It has to*, because, as the Chief Engineer puts it, "Every time a shovel is idle, there is a loss of production that is never made up."

If you have an extremely abusive use for portable cable or cord, let us show you just what AMERCLAD can do. There is a standard AMERCLAD Cable or Cord for every special application—whether it's a hand-operated drill, or a river dredge. Just send the coupon.

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL COMPANY
GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SPECIAL Job!

- **oilproof portable cords**
- **plastic machine tool & building wire**
- **special purpose cords & cables**

WIRE & CABLE

SEND THE COUPON

American Steel & Wire Division
Room GE-112, Rockefeller Building, Cleveland 13, Ohio

☐ Please give me more information on U·S·S AMERCLAD.
☐ Have representative call.

Name.....
Title.....
Company.....
Address.....
City.....State.....

UNITED STATES STEEL

Washed iron ore is stacked at rate of 600 long tons per hour by this 570 ft. track-mounted trailer belt conveyor (fed by fixed belt conveyor) and Link-Belt 115 ft. radius revolving, self-propelled stacker, which can make storage pile 42 ft. high.

Rely on one source... one responsibility for the best in belt conveyors

LINK-BELT engineering experience plus quality components combine to cut handling costs

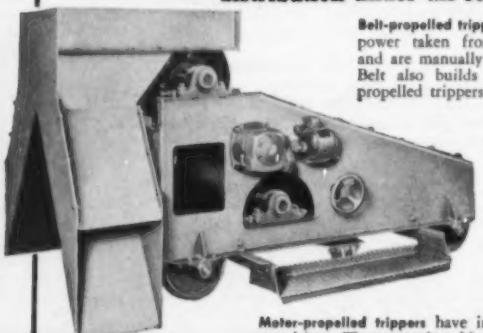
WHETHER you must move a few tons a day or several thousand tons per hour . . . whether the haul is measured in feet or miles—you'll find the answer in belt conveyors at Link-Belt.

Here's a nation-wide engineering organization that will follow through from start to finish—the designing, manufacturing, erecting of conveying equipment. And nowhere can you match Link-Belt's combination of vast application experience . . . complete line of quality components . . . expert coordination of related equipment.

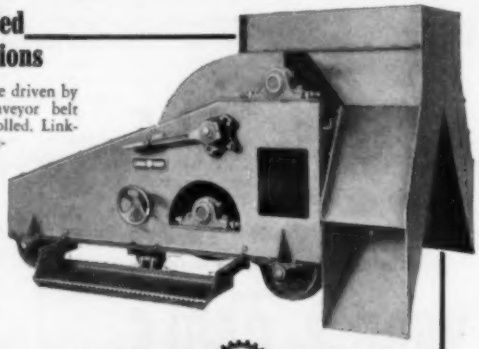
Get all the facts from the Link-Belt office near you. Link-Belt engineers are glad to work with you and your consultants—help you get the finest in belt conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

LINK-BELT Trippers offer controlled distribution under all conditions



Belt-propelled trippers are driven by power taken from conveyor belt and are manually controlled. Link-Belt also builds winch-propelled trippers.



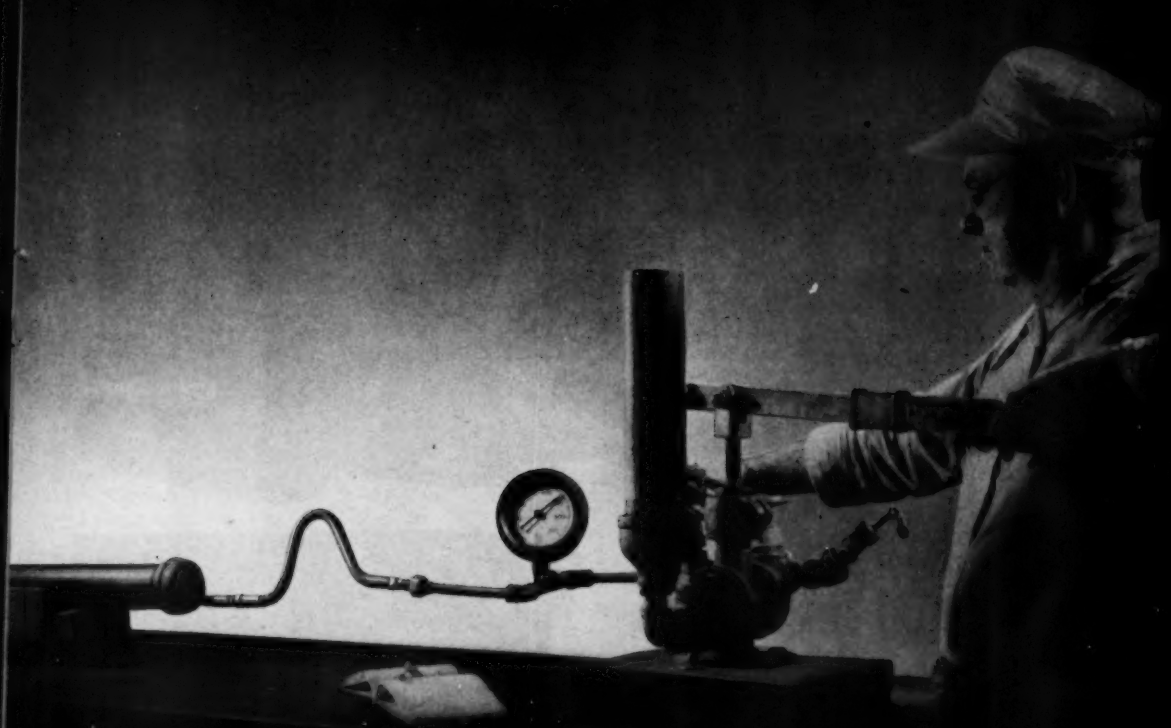
Motor-propelled trippers have independent drives. They are adaptable to automatic operation and control.

12,600-B

LINK-BELT

BELT CONVEYOR EQUIPMENT

PROGRESS IN EXPLOSIVES...



FOR WORKING UNDER PRESSURE

Hercules' research has developed explosives that shoot successfully even under the severe water pressures encountered today in seismograph prospecting.

In the laboratory test shown here, a cartridge of Hercules Vibrogel® 3 is sealed in the steel "bomb" at the extreme left. It then undergoes prolonged exposure to pressures greater than those ordinarily found in actual field use. Because Vibrogel 3 embodies a new conception of explosives research, it detonates despite these extreme conditions.

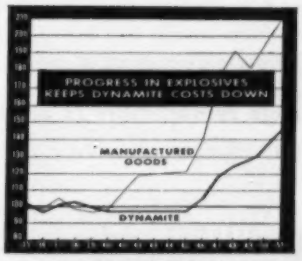


Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

HERCULES POWDER COMPANY

INCORPORATED

Explosives Department, 960 King St., Wilmington 99, Del.

XR62-7

ANNOUNCING THE NEW LORAIN SCOOP SHOVEL

SCOOP OF THE YEAR

Here is a new, revolutionary, high-speed loading tool for mines, pits and stockpiles! It's the LORAIN SCOOP SHOVEL, a new front end attachment for the popular Lorain TL-25 "Series". This new front-end loader eliminates the *travel* phase of the loading cycle. The *turntable swings a full 360°* to dig and dump — no travel movement is required. With its extra-long reach of *24* feet, the Scoop Shovel can work a wide radius with no crawler motion. The job can be "cleaned up" easily — trucks can move in close for efficient, time-saving loading. And— the Scoop Shovel can load on the down-grade, on the level and on up-grade. Standard bucket capacity is 1-1/4 cu. yd. and the bucket can lift to a dumping height of 14 feet to load into the largest hauling units. Operator visibility is at its very best.

Investigate this NEW method of high speed loading that gives you the EXTRA advantages of complete convertibility to all five other front ends.

THE THEW SHOVEL CO., LORAIN, OHIO

LOW HEIGHT is ideal for low headroom operations, such as this underground mine where the Scoop Shovel is shown loading a hauling unit. Note how the bucket is extended on the telescopic boom to "reach out" to the wagon.

NEW HAVEN TRAP ROCK CO., New Branford, Conn. loads trucks in record time because of big bucket capacity and fast action of their Lorain TL-25K Scoop Shovel. Note excellent operator visibility and accurate load spotting.

ATTENTION: **LORAIN TL-25 OWNERS** . . . The new Scoop Shovel can be attached to your present machine, quickly and easily. And you can reconvert to other front-ends at any time. Ask your Thew-Lorain Distributor for the story.

THEW LORAIN

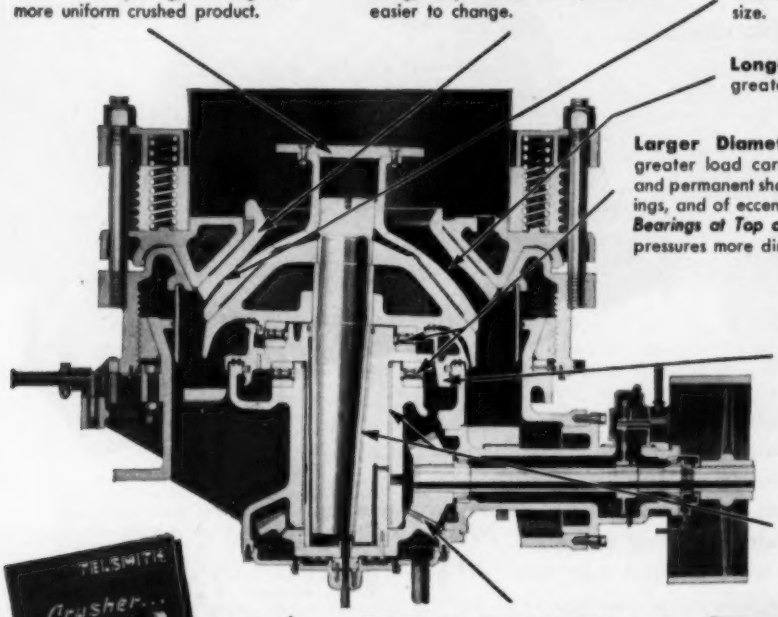
Outstanding FEATURES OF THE TELSMITH *Gyrasphere*®

Feed Distributor gives an even distribution of the feed around the entire feed opening, resulting in a more uniform crushed product.

Gun-Lock for Holding Concave Ring — Automatic self-tightening, requires no bolts, and is easier to change.

Longer Parallel Crushing Zone gives a finer, more uniform product with a larger percentage down to size.

Longer Crushing Stroke gives greater capacity and less packing.



Larger Diameter Roller Bearings with greater load carrying capacity. Give perfect and permanent shaft alignment in eccentric bearings, and of eccentric in main frame. ***Both Roller Bearings at Top of Eccentric*** carry all crushing pressures more directly into heavy main frame.

Patented Rotary Seal with piston ring and labyrinth seals, gives most perfect protection against entrance of dust or water, or loss of lubricant.

Higher Eccentric Bearings give more bearing area in the upper zone of greatest crushing pressures, assuring more permanent shaft and eccentric alignment and longer bearing life.

Send for Bulletin No. 274

Main Drive Gear At Bottom of Eccentric assures more perfect and permanent alignment of gear and pinion, giving smoother running and longer life for both gear and pinion and less strain on countershaft bearings.

V-42

STYLE FC
FINE CRUSHING

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. · 211 W. Wacker Drive Chicago 6, Ill. · 713 Commercial Trust Bldg. Philadelphia 2, Pa. · 238 Main Street Cambridge 42, Mass. · Bochck Eqpt. Co. Milwaukee 3, Wis. · The McLean Co., 3525 Lakeside Ave. Cleveland 14, Ohio

Marcus Eqpt. Co., 432 Main St., Rochester, Mich. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif.

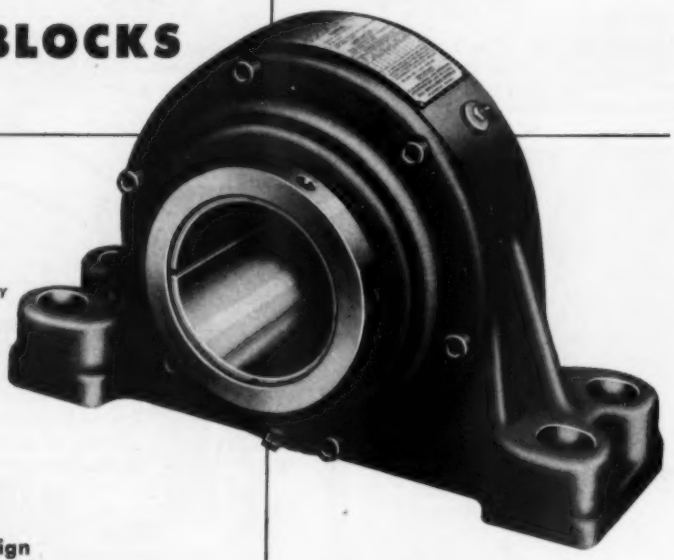
Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 16, Va. • Interstate Equipment Co., Statesville, N. C.

NEW

DODGE-TIMKEN ALL-STEEL PILLOW BLOCKS

HEAVY DUTY CAPACITY!

LESS SPACE! LESS WEIGHT!



A JOINT ENGINEERING DEVELOPMENT BY DODGE AND THE TIMKEN ROLLER BEARING COMPANY

- All-Steel construction
- A new Timken bearing design
- High radial and thrust capacities
- Compact—minimum dimensions
- Minimum weight with maximum strength
- Fully self-aligning with spherical outer race
- Both expansion and non-expansion types
- Adapter mounting, proven through the years
- Double piston ring seals
- Sealed both on and off the shaft
- Fully assembled, permanently adjusted, lubricated and sealed at the factory

Here are the bearings for industry's toughest jobs. High radial and thrust capacities. Stamina to take heavy shock loads. And all-steel construction packs this load-carrying capacity into less weight and less space. Engineers are already specifying "Dodge-Timken All-Steel" for some of America's largest projects. Write for details and delivery dates, or call your Dodge Distributor.

DODGE MANUFACTURING CORPORATION
4000 Union Street, Mishawaka, Indiana

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

DODGE
of Mishawaka, Ind.

Allis-Chalmers HD-20 Tractor gives HIGHER OUTPUT with LESS UPKEEP

Exclusive Hydraulic Torque Converter Drive is One BIG Reason Why

The hydraulic torque converter drive, *exclusive* in the Allis-Chalmers HD-20 Tractor, brings you productivity, handling ease and dependability that makes every hour, every day of the season count . . . gives the operator the equivalent of hundreds of gear ratios in two speed ranges . . . automatically selects the proper speed for maximum production.

DOZING With hydraulic torque converter drive you take full advantage of available horsepower . . . you'll roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

PULLING There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

EXCAVATING With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

PUSHING The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

★ Weight: 41,000 lb.
175 Net hp. at flywheel

ORIGINATOR OF THE TORQUE CONVERTER TRACTOR

ONE STAGE BULLDOG HAMMERMILL

NON-CLOG MOVING BREAKER PLATE

CARLOADS

(PARTIAL SHIPMENT FOR ONE CUSTOMER)

BULLDOG HAMMERMILLS

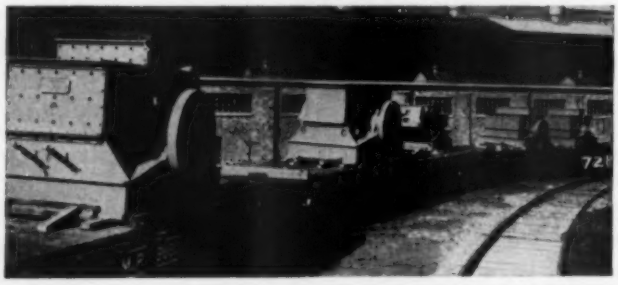
(PRIMARY - SECONDARY - FINE REDUCTION)

BULLDOG HAMMERMILLS for DRY OR WET STICKY MATERIALS FOR THOSE TOUGH HEAVY-DUTY CRUSHING JOBS

1 to 1000 ton capacity

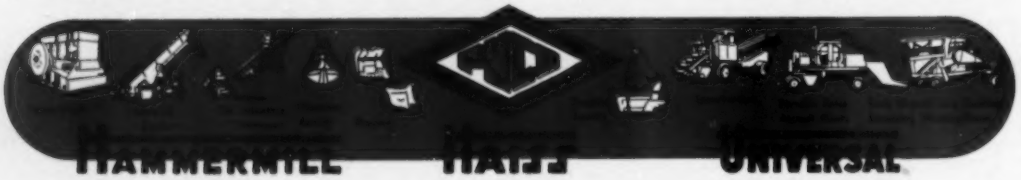
We will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

ASK FOR LIST OF INSTALLATIONS



HAMMERMILLS, INC. *division of* **PETTIBONE MULLIKEN CORP.**

4766 W. Division St. Chicago 51, Illinois Phone SPaulding 2-9300



CHICAGO NEW YORK CEDAR RAPIDS

the New

OLIVER "OC-18"

the Operator's Dream come true!

Here's a tractor that has been designed specifically to make life as easy as possible for the operator. Just check this list of "easy operating" features —it puts the "OC-18" 'way out in front as the tractor that gets more done . . . faster . . . every day.

1. Over-Center Clutch. The clutch bar runs across the full width of the dashboard. No need here for the operator to hunt for a single lever . . . to take his eyes off the work.

2. Air Steering is *Standard Equipment* You can steer the "OC-18" with just two fingers of one hand.

3. Push Button Electric Starting. The husky starter of the "OC-18" gets the engine going . . . quick.

4. Cold Weather Starting Aid . . . standard equipment on the Oliver "OC-18" for fast, easy starting in extremely low temperatures.

5. Center-Positioned Gear Shift Lever . . . is located right where it's easiest to reach.

6. Ample Leg Room . . . no cramped legs after a hard day's work with the "OC-18".

7. Convenient Foot Parking Brakes are standard equipment on the "OC-18".

8. Comfortable, Two-Man Seat . . . plenty of room for two men in this upholstered seat.

9. Easy-Acting Friction Throttle is located at the right arm rest of the seat in the most convenient position for the operator.

You get plus performance too! A full 126 drawbar horsepower . . . greater stability . . . more track on the ground. Just note the photograph. See how the track hugs the ground almost its entire length. It means real pulling power . . . greater stability and better balance for dozing.

Try out this great new tractor yourself. Ask your Oliver Industrial Distributor to arrange a demonstration. When you've seen the "OC-18", you'll never be satisfied with any other big tractor.

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

A complete line of industrial wheel and crawler tractors

OLIVER

The OLIVER Corporation, Industrial Division
400 W. Madison Street
Chicago 6, Illinois

Gentlemen:

Please send me literature on the Model "OC-18" Industrial Crawler Tractor.

Name .....

Company ..... **Dept.** .....

Address .....

City ..... **State** .....

for lower **first** and **last** costs

power with this tough cable

ANACONDA

BUTYL-INSULATED HIGH-VOLTAGE CABLE

—easier to install—lasts longer

—handles better

Mine after mine comes up with the same answer. So do pit and quarry operators. *It pays to use this modern power cable*—ANACONDA Type AB*, for uses up to 15 kv. It is exceedingly hard to damage by impact, crushing, twisting or abrasion. Butyl insulation has superior long-aging characteristics, improved resistance to moisture, ozone, heat. Neoprene jacket—as tough as they come—has real flexibility and great strength. This cable handles well and lasts longer in all weather. It has high dielectric strength, affords excellent protection against acids, oils, and even flame.

Our mine specialists will gladly show you a sample of this safety cable. And they can also show you just the right cable for your shovels, drills, shuttle cars, and the new continuous mining machines. See how recent improvements have made famous ANACONDA Securityflex* portable cables even better. Call your nearest Anaconda Sales Office or Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Trademark

- *butyl insulation*
- *neoprene jacket*
- *copper tape shielding*
- *color coding*
- *stranded copper ground wire*

the right cable for the job **ANACONDA®** wire and cable

every other MARION 151-M on the IRON RANGE is a REPEAT ORDER

A NOTABLE RECORD OF ACCEPTANCE

Many of the biggest companies on the Iron Range are owners of MARION 151-M shovels.

MORE THAN HALF of these MARION owners have two or more 151-M machines.

In these days of urgent demand for increased ore production —days of high operating costs—days in which it is perhaps more important than ever to make wise selections of equipment, MARION is humbly proud of this unusual record of acceptance.

Ask your nearest MARION representative about the jobs the 151-M is doing in quarrying, coal stripping, construction and mining.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yds. to 45 cu. yds.

Help Truth Fight Communism

FREEDOM-GRAM

DO YOU LISTEN TO RADIO FREE EUROPE? I HOPE YOU DO, FOR I AM ONE OF MILLIONS OF AMERICAN CITIZENS WHO HAS VOLUNTARILY CONTRIBUTED TO BUILD THESE STATIONS, WHICH BRING TRUTH TO YOU WHO ARE DEPRIVED OF IT.

IN AMERICA MILLIONS REGULARLY PRAY FOR AN UNDERSTANDING BETWEEN OUR PEOPLES. PLEASE ADD YOUR PRAYERS TO OURS. SURELY OUR COMMON FAITH IN GOD IS THE PLACE WHERE HOPE FOR FREEDOM BEGINS.

I AM A (occupation)_____

NAME_____

ADDRESS_____

Sign and Mail this FREEDOM-GRAM today
Let it flash words of hope behind the Iron Curtain

THE SAMPLE Freedom-Gram above can be your message of truth and hope to the enslaved millions behind the Iron Curtain.

Your signature and those of millions more Americans are needed *now* on Freedom-Grams such as this. Millions of these personal messages will be sent to the Communist-dominated people behind the Iron Curtain as pledges of our common hope for a free world.

This year the Crusade for Freedom is endeavoring to raise $4,000,000 which will be used to support Radio Free Europe and Radio Free Asia.

These stations are playing an important part in the fight to win the cold war—and avert the hot war. Already the Communists are desperately trying to stop the steady stream of truth which is penetrating the Iron Curtain. They are failing, and will continue to fail as long as these powerful stations are kept on the job. Will you help in this most important of campaigns?

Mail above Freedom-Gram to Crusade for Freedom, c/o your Local Postmaster, enclosing any contribution you wish to make. You may receive grateful replies. If you should be unable to translate them, free translations may be obtained by forwarding them to the same address. Send your Freedom-Gram today!

Help Truth Fight Communism
Give to Crusade for Freedom

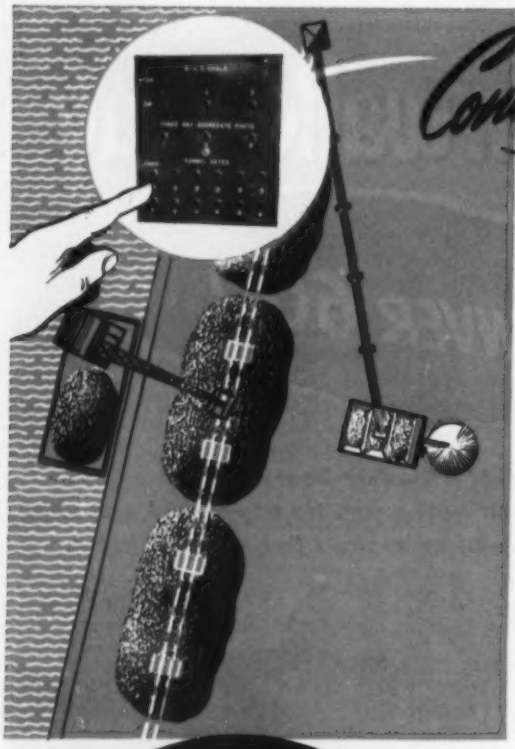
Start it...then walk away

IT'S THE GARDNER-DENVER 600

ANY
ANY
ANY

SINCE 1859
GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS



Concrete at your fingertips

This ERIE plant is truly a PUSH BUTTON OPERATION

Aggregates are brought to the plant site by barge and loaded into stockpiles over a tunnel conveyor.

An "Aggregate Control Panel" located at the tunnel entrance has bin signal lights which indicate the aggregate level in each bin compartment. At this panel are also located the controls for the air-operated tunnel gates, bin distributor, and belt conveyors—*all under the control of one man.*

Batching controls are likewise centralized for one man operation. Cement, water, and admixtures are batched automatically while the operator weighs out the aggregates with fast acting air-operated gates.

The two central mixers discharge the specification concrete into a central confining hopper at an average rate of better than 100 cubic yards per hour. Trucks are loaded as fast as they can be spotted.

Take advantage of ERIE'S engineering experience in planning your high production concrete plant.

At left, AggreMeter equipped with air operated gates. Cemeter equipped with vane and screw feeders for automatic weighing and air operated discharge valve.

Below, Erie CTES 202 yd. Bin with 872 bbl. ground storage silo. Sollitt Construction Co., Beverly, Ohio.

ERIE

STEEL CONSTRUCTION COMPANY

6211 GEIST ROAD • ERIE, PENNSYLVANIA

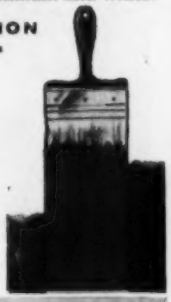
Cut your maintenance costs on every rustable metal surface indoors and out with this practical, sensible coating!

STOP RUST! with RUST-OLEUM

Day in and day out, your equipment and metal structures face the *toughest rust-producing conditions*—dust, fumes, rain, moisture, heat and general weathering! To *stop rust* and protect your metal surfaces you need RUST-OLEUM!

RUST-OLEUM may be applied directly over surfaces *already rusted* without removing all the rust. Just wirebrush and scrape with sharp scrapers to remove rust scale and loose particles . . . then apply by brush, dip, or spray. Costly sandblasting and chemical pre-cleaning are not usually required. This means that one man often does the work of two with RUST-OLEUM! Practical, too . . . because RUST-OLEUM *beautifies as it protects* in all colors, aluminum and white.

RUST-OLEUM CORPORATION
2716 Oakton Street • Evanston, Illinois



May be applied directly over rusted surfaces without removing all the rust!
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PROTECT CONVEYORS • PIPES • BUILDINGS • EQUIPMENT • TANKS
STACKS • METAL SASH • GIRDERS • STAIRWAYS • CRUSHERS • DUSTERS

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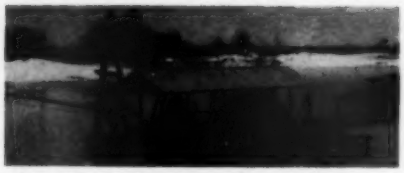
- ☐ Have a Qualified Representative Call
- ☐ Full Details on Free Survey
- ☐ Complete Literature
- ☐ Nearest RUST-OLEUM Source

JAMES · WARD
Says –
WARD GRAVEL CO.
Washed Sand and Gravel
FLOMATON, ALA.
Sept. 19, 1952
Thomas Foundries
Birmingham
Alabama.
Dear Sirs:
Please quote us a price on another Thomas Pump Series PL, exactly like the one we bought nearly two years ago.
Also quote us on an eight inch with ten inch suction.
Sand and gravel outfits that don't use Thomas Dredge Pumps don't know what they are missing. Your pump puts out more material for the same size and power, and under the same conditions, than any pump we have ever used.
Then, the life of your parts is remarkably long and upkeep costs are low. Maybe the most important feature of all is your over-night service on repair parts. Your quick shipments save us money and many worries. This means a lot to us.
Please quote us as soon as possible. We are anxious to replace one of another make and get rid of some more troubles.
Sincerely yours,
Ward Gravel Co.
By: James E. Ward Owner
JEW
MW

"SAND and GRAVEL OUTFITS WITHOUT THOMAS DREDGE PUMP Don't Know What They're Missing!"

HERE ARE HIS REASONS

1. "MORE PRODUCTION"
2. "LOWER UPKEEP COSTS"
3. "LONG PARTS LIFE"
4. "OVERNIGHT SHIPMENT OF PARTS"
5. "LESS DOWN-TIME"
6. "SAVE MONEY AND SAVE WORRY"



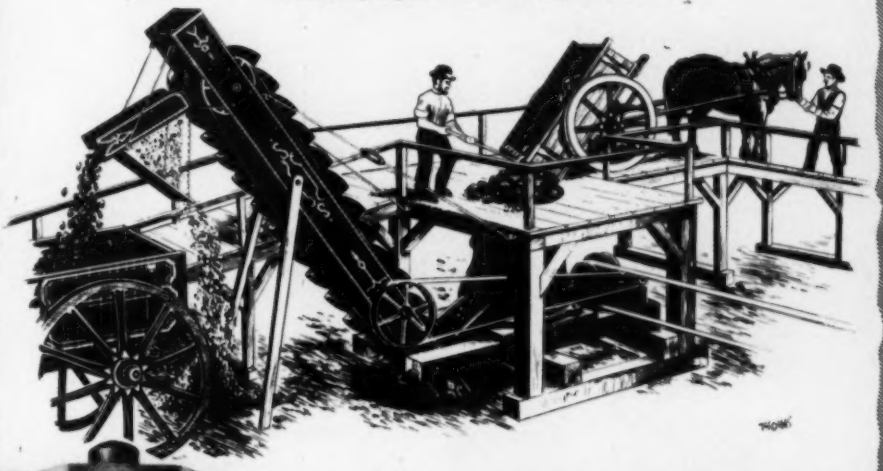
Ward Gravel Company Plant in Operation

IF YOU DO IT WITH SAND & GRAVEL PUMPS, YOU CAN DO IT BETTER WITH A "THOMAS"

If you are interested in lower sand-and-gravel production costs, write for literature on Thomas Durable Dredge Pumps. Address THOMAS FOUNDRIES, INC., Birmingham, Alabama.

At the turn of the century,

machinery like this was used for breaking stones at quarries. Although this equipment was a great labor saver, it was soon made obsolete by a great number of improvements.



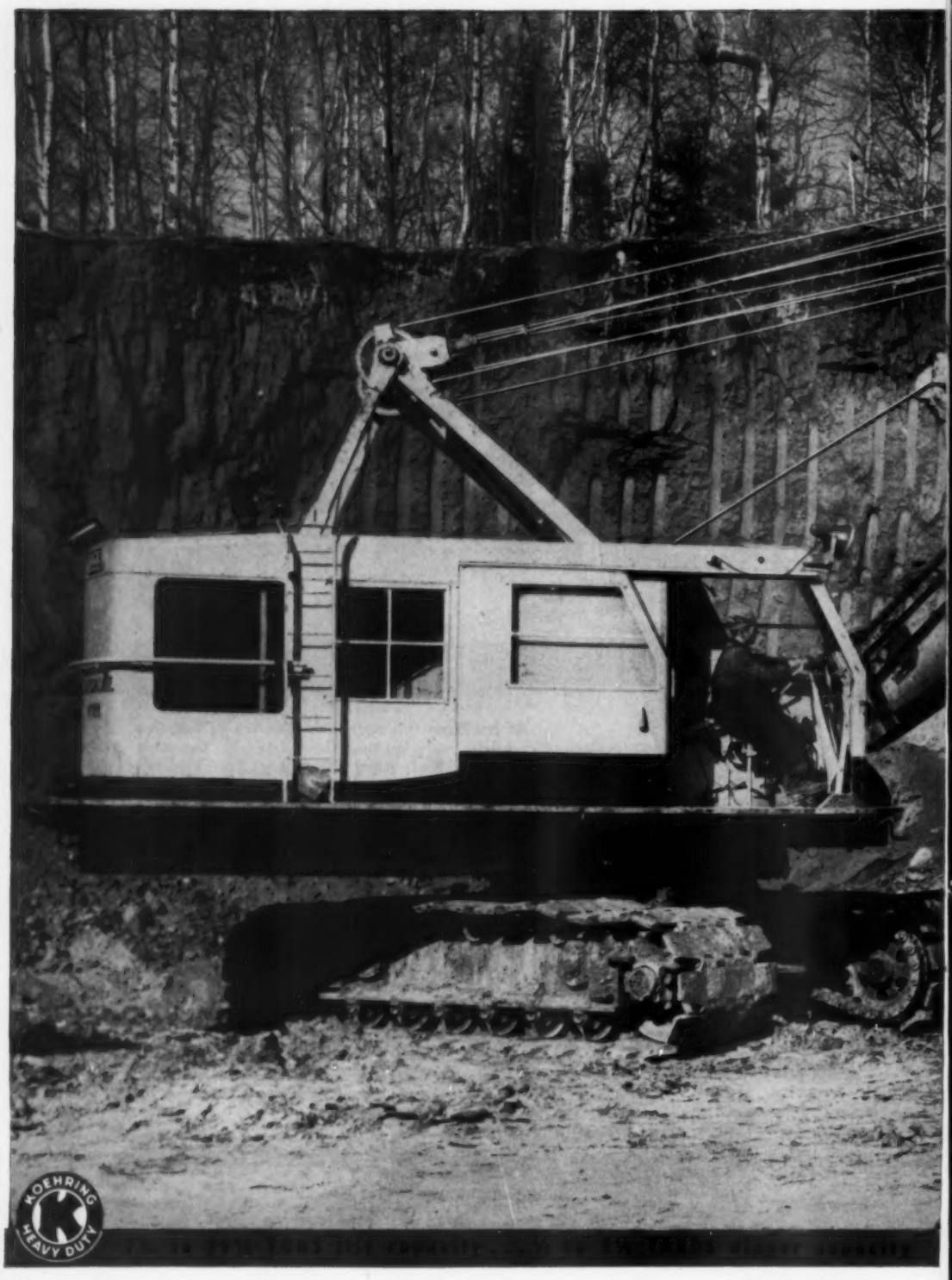
Traylor TC Gyratory, with its curved concaves and bell head, contains several design features found only in Traylor crushers. Bulletin 128 gives complete details.

At the time this equipment was on its way out, Traylor crushers were making their debut in the rock products industry. Since then, Traylor engineers have continued to improve their equipment to the point where the name "Traylor" . . . anywhere in the world . . . means dependable, economical performance. Today as always, it is experience that tips the scales in favor of the men who build the best. Traylor has experience . . . half a century of it.

TRAYLOR ENGINEERING & MANUFACTURING CO.
1466 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York, Chicago, San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

a **Traylor** *leads to greater profits*


KOEHRING
HEAVY DUTY

Get all the facts on
"KOEHRING WORK CAPACITY"

With any shovel or crane, all mechanical features, operating advantages, speeds and capacities add up to one deciding factor . . . *cost per yard moved or ton lifted.* To make sure you get the biggest profit advantage in excavators and cranes, get all the data on "KOEHRING WORK CAPACITY". For specific facts and figures, see your Koehring distributor soon.

K229

KOEHRING Company

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Subsidiaries: Kwik-Mix • Johnson • Parsons

...a *Crushing Record* by:
ED LUNDIN, General Contractor
Mankato, Minnesota
with his DIAMOND "66"
ROTOR-LIFT PLANT

3/4" minus material...

20 to 40% crush...

208 yds. per hr. average!

ED. LUNDIN
GENERAL CONTRACTOR
1616 No. 4TH STREET
MANKATO, MINN.

Diamond Iron Works, Inc.
1728 Second Street North
Minneapolis, Minnesota

Gentlemen:

I could not help but write you to tell you how satisfied we are with our new Diamond No. 66 Portable Rotor Lift Crushing Plant. Last season we were crushing a job for Highway 61 on the north shore of Lake Superior and averaged 208 yards an hour of 3/4" minus material in a pit that contained from twenty to forty per cent crushing. It is our understanding that the records of the Minnesota State Highway Department show that there has never been another job of this nature that has set such a high production. This production was obtained with a minimum amount of down time, and we certainly wish to let everyone know the success that we have had in using your equipment.

Incidentally, this is the third Diamond Plant that we have operated and all of them have worked out very satisfactory.

We might mention here too that we have worked in most of the gravel pits in the south central, western, and northern sections of Minnesota and have found that we can produce more gravel per hour with our Diamond Plant than most plants of an equal size or larger that have worked in the same pits.

Again we wish to tell you how satisfied we are, and if in the future we will require another plant it certainly will be another Diamond.

Yours very truly
Ed Lundin, Contractor
by
Edward H. Lundin

Edward H. Lundin

UPPER LEFT—Loading tons of heaviest pit-run in the state. Note spline-shaft drive, position of power unit. Power unit is easy to get at for inspection and repair.

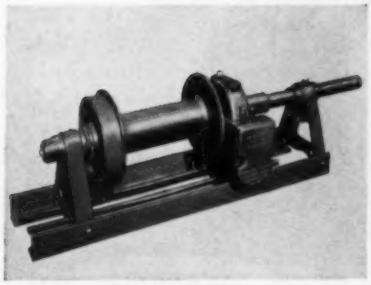
BOTTOM—Dozing pit-run into Diamond shovel-loading hopper. Diamond grizzly and single eccentric plate feeder keep continuous, regulated feed, make record production possible.

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1756 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

Diamond Crushing Plants assure: greater output . . . shorter material flow . . . quicker set-up, knock-down . . . less down time . . . more all-round portability.

WHATEVER YOU HAUL

MORE with Gar Wood



If "pull" is your problem, a Gar Wood winch is the answer. Gar Wood winches are tougher . . . last longer . . . are safer to operate . . . require less maintenance. Self-energizing, automatic safety brake stops and holds any load up to winch capacity yet releases fully without drag. Write for information today.

It's True! Whatever you haul, you can haul more in Gar Wood Bodies *without exceeding legal load limits.* Gar Wood Bodies and Hoists are designed and built to eliminate dead weight without affecting vital strength and rigidity. This combination of minimum weight with maximum strength and rigidity assures extra payload—and extra profits—on every trip.

Box-type tailgate construction, forged steel tailgate pins and hooks, plus horizontal box bracing save dead weight yet put extra strength where it is needed to withstand load concentrations when dumping or spreading. Rear corner posts are extra strong to withstand shock loads and maintain permanent alignment. Rear apron is welded solidly to the corner posts for maximum rigidity. Body panels are reinforced with V-type braces to add extra strength without excessive weight.

There's a Gar Wood Body and Hoist Combination in every type and capacity to meet your every operating requirement. Find out today how you can *put more pay in your payloads* by putting Gar Wood Bodies and Hoists to work on your hauling job. Mail the coupon below NOW!

Gar Wood Industries, Inc.
34912 Main St., Wayne, Mich.
Att'n: Customer Service Dept.

Please tell me how I can increase operating revenues by using Gar Wood Bodies and Hoists.

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Company_____

Address_____

City_____ Zone_____ State_____

GAR WOOD INDUSTRIES

GAR WOOD INDUSTRIES, INC.

WAYNE, MICHIGAN

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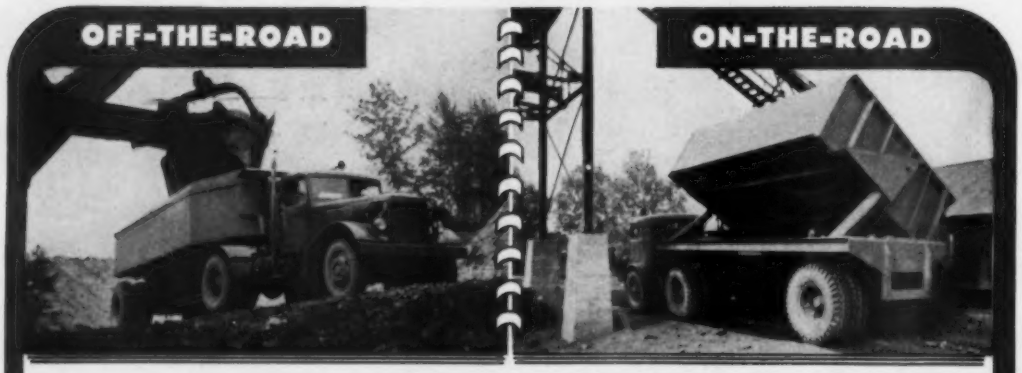
CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Loaders, Truck Mounted Road Graders



GENERALS

go in—get the load—carry it out and over-the-highway

FASTER! EASIER!
At Lower Cost!

Pile on the tons. The General L. C. M. is built to move heavy loads out over jagged surfaces without cuts, bruises or snags.

Move more tons over the road on this tough, dependable General H.C.T. Longer wearing, safer running, quicker stopping.

THE GENERAL *L.C.M.*

THE GENERAL *H.C.T.*

Make Every Worn Tire Work Longer for More Profit!

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Worn Tires with the New General Truck Tire Tread of Your Choice

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A GENERAL TIRE SERVICE

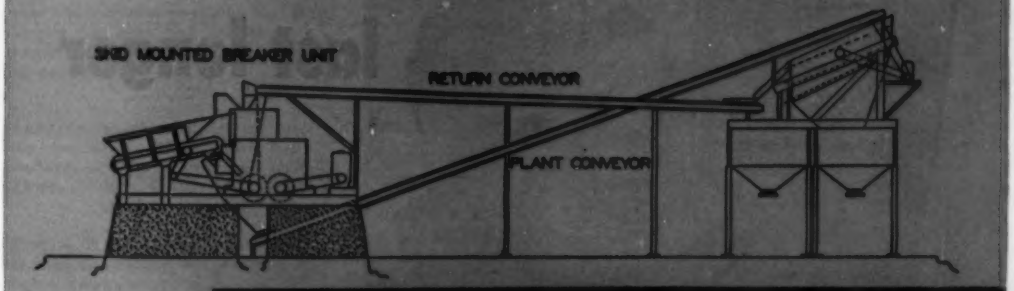
You're throwing away money when you throw away worn tires or accept an ordinary "adjustment" for them. Let your General Tire Dealer—a tire expert—restore worn tires with famous factory controlled Kraft System Recapping. You choose from the complete line of on and off-the-road new General Tire treads and he'll put that tread on your worn tire. He can do sectional repairs too. Get Kraft System Recapping—get more profit from every tire.

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

CONTROLLED IMPACT ACTION

Get BIG PLANT TONNAGE

at ROCK BOTTOM COST!



with a PMCO IMPACT MASTER HEAVY DUTY IMPACT BREAKER

Patent Pending

Step into big profit operations with minimum plant investment! A PMCO Impact Master setup eliminates secondary crushers and auxiliary equipment . . . saves on power, labor and maintenance costs . . . gives you top speed production of top quality aggregate.

With the PMCO Impact Master's high ratio of reduction, the complete crushing job is done in one fast controlled breaking operation. The breaking is accomplished by rigidly mounted rotor hammers, producing a top quality, uniform gradation cubical aggregate. Finished product size is easily controlled, and simple mechanical adjustments change the percentage of sizes. You can use the PMCO Impact Master for producing road building and concrete aggregates, and adjust it for the simultaneous production of aglime when desired.

PMCO Impact Masters have capacities up to 500 tons per hour. Let us give you profit-making details on the size that meets your requirements. Write today.

PMCO Impact Master Division, Universal Engineering Corporation, 625 C Avenue N. W., Cedar Rapids, Iowa

UNIVERSAL ENGINEERING CORPORATION division of PETTIBONE MULLIKEN CORP.

619 C Avenue N.W., Cedar Rapids, Iowa
Phone 7105

4700 W. Division St., Chicago 51, Illinois
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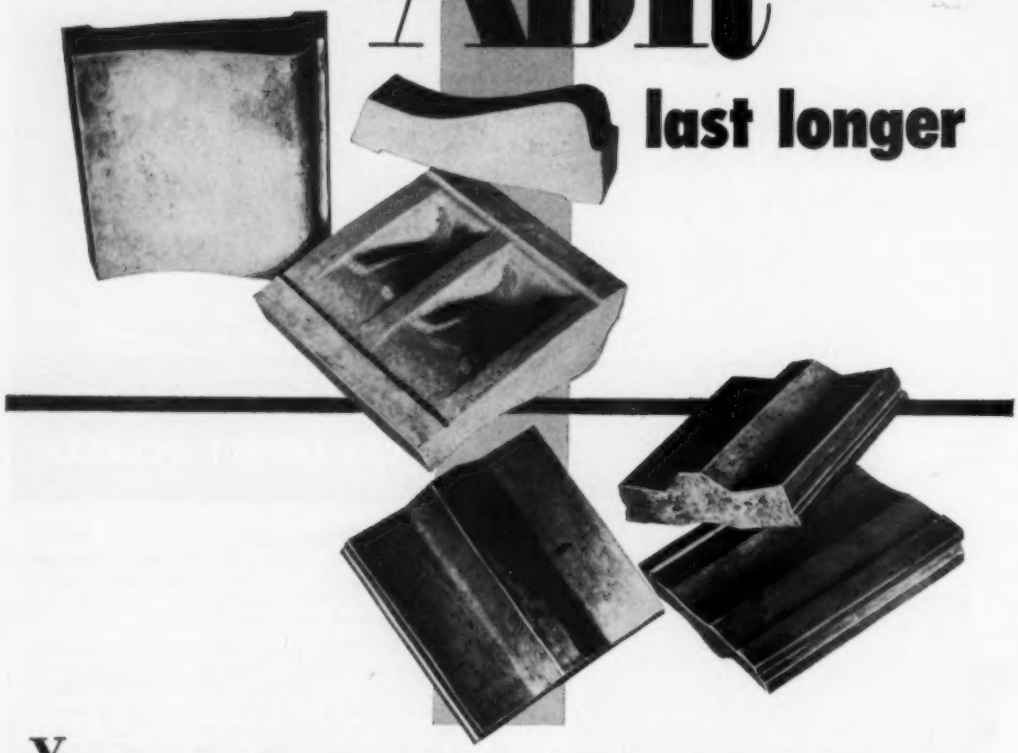
cement mill liners in ABK METAL last longer



You can cut replacement cost of liners in primary, secondary or tertiary compartments—for wet or dry grinding of raw stone or finished product—with ABK Metal abrasion resistant liners.

Here are typical reports from operators who have experienced real savings. "ABK Metal outlasted chilled white iron 2.9 to 1"..."ground an additional 1.5 million barrels before replacement" . . . "ABK liners tripled our interval between relinings"... "less downtime for replacements and lower labor maintenance costs".

Moreover, ABK liners maintain desired contours, providing maximum agitation and grinding motion in the mill.

Let us show *you* how ABK Metal—a nickel-chrome alloy of controlled structure with an extreme hardness (500-700 Brinell, as required)—can lower costs and improve performance in your mills.

for better protection against abrasion specify ABK METAL

American Brake Shoe Company

BRAKE SHOE AND CASTINGS DIVISION

230 Park Avenue, New York 17, N. Y.

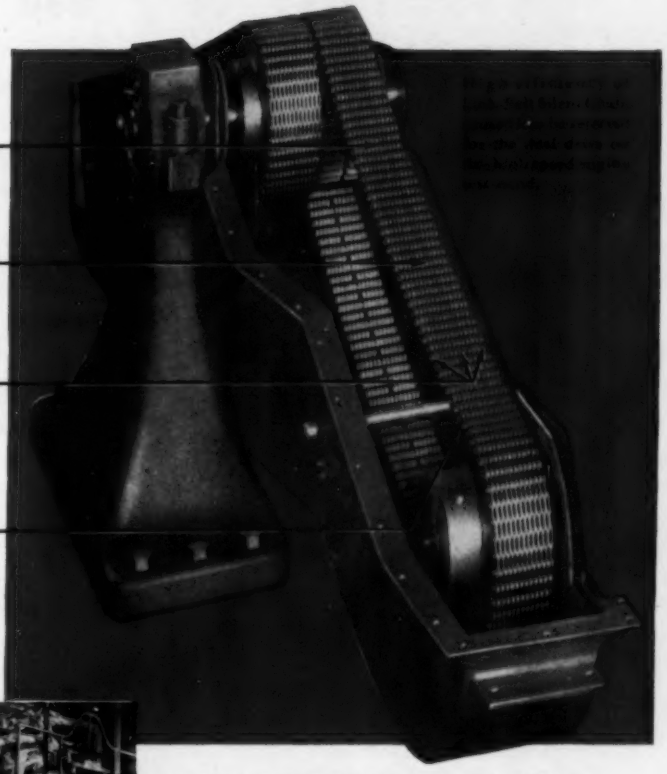
Choose the proved way
to transmit high hp at high speeds

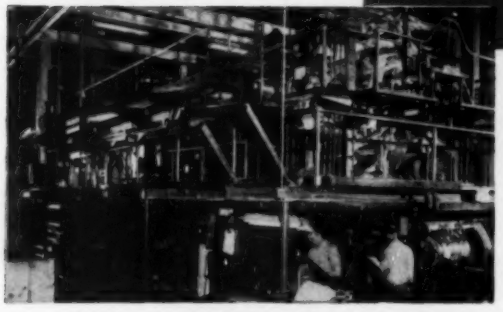
Silverstreak Silent Chain does the job with a single strand—eliminating the dangers that come with one or more belts in a group carrying more than their share of the load.

Husky Silverstreak metal link construction combines the ability to carry heavy overloads with the resilience that really absorbs shock.

"Pull" is distributed equally across Silverstreak Silent Chain. No possibility of uneven running—slapping.

Silverstreak Silent Chain doesn't rely on tension to get pulling power—chain meshes with teeth—gives POSITIVE drive—no chance for slip.





Four 125 hp Silverstreak Silent Chain Drives power this press on which 46% of all "Readers Digest" copies are printed. Chain speeds of 4600 fpm are maintained 24 hours a day, six days a week.

LINK-BELT

SILVERSTREAK SILENT CHAIN DRIVES

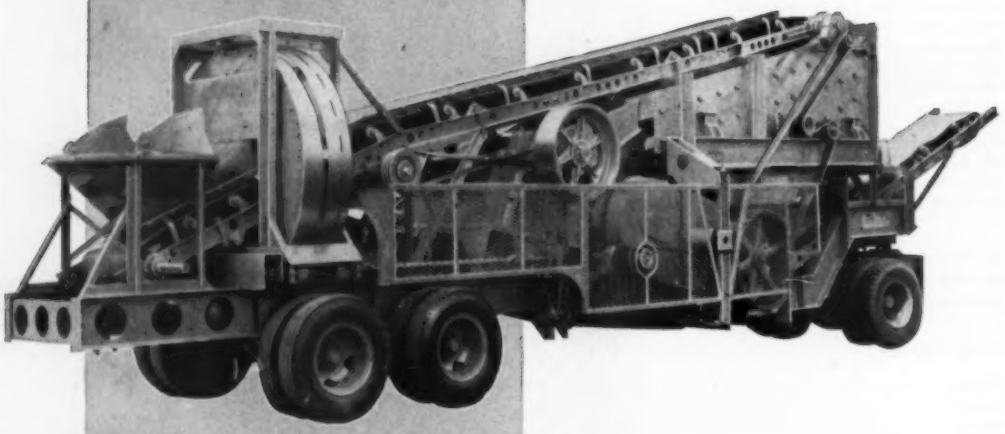
LINK-BELT Silverstreak Silent Chain Drives are slip-proof . . . slap-proof . . . shock-proof

For the finest in modern power transmission, use Silverstreak Silent Chain the next time you have a demanding drive problem. These long-life drives—more than 98% efficient—have met every test for rugged service. There are many applications where Silverstreak Silent Chain has been in continuous operation for 15 years and more . . . without replacement . . . with only routine attention. Call the Link-Belt power-transmission engineer in the office near you for any information you require.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 12,600

THE HOTTEST PLANT THAT EVER HIT A GRAVEL PIT

THE NEW
UNIVERSAL
880 GRAVELMASTER
Senior "R"



IT'S BIG *IT'S PORTABLE*

IT'S DESIGNED TO MEET WEIGHT LIMITS

At last! Here's the complete single unit dual-crusher gravel plant that gives you top capacity and meets state highway weight limitations. It eats up gravel at a profit-making clip and can be moved on to new locations quickly.

Operators report tremendous capacities from its big jaw, extra large rolls, and big screen. They're amazed by its fast and easy setup, low power requirement, smooth operation, and rugged strength. You'll want a Gravelmaster Senior "R" for your operations. Ask your Universal distributor for details or write for information.

TOP CAPACITY FEATURES

- 1036 roller bearing overhead eccentric jaw crusher
- 3022 roller bearing star gear drive secondary roll crusher
- 4' x 12' 2½ deck roller bearing inclined gyrating screen

UNIVERSAL GAVE CEDAR RAPIDS ITS ORIGINAL FAME FOR QUALITY CRUSHERS

IN CEDAR RAPIDS SINCE 1906

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Built for a Long Grind

Here are three reasons why Allis-Chalmers grinding mill motors help keep your mill grinding economically year after year:

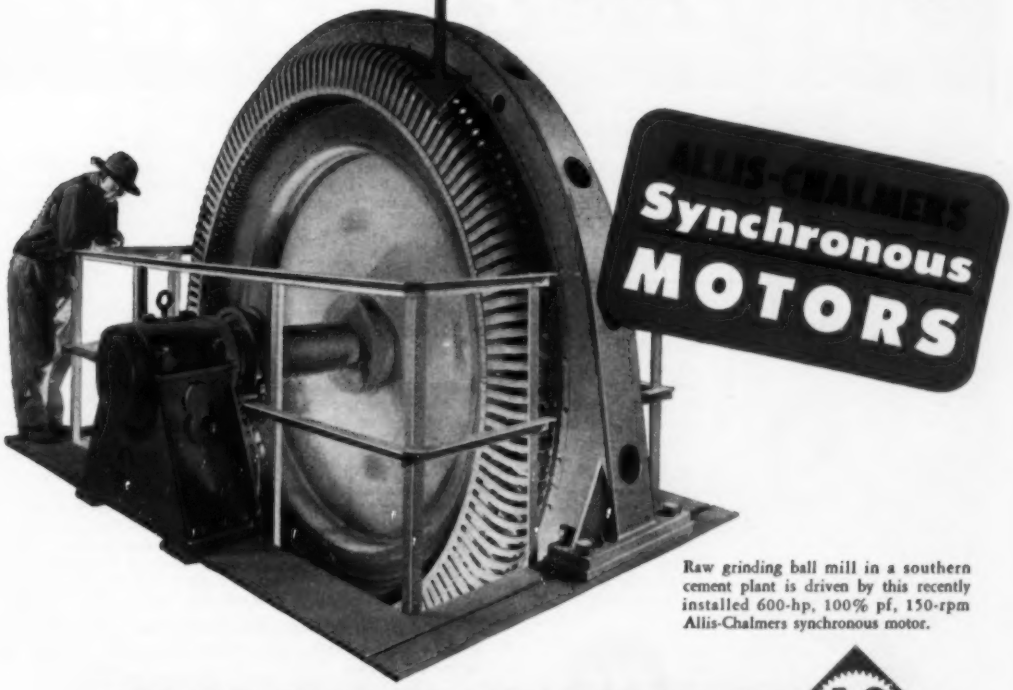
Each motor is engineered for its job. A-C's half century of experience building electrical equipment *and* processing machinery assures torque and power factor characteristics tailored to the individual installation requirements.

Time-proved basic design features contribute to long life and trouble-free operation. These are described in Bulletin 05B7648.

Adequate manufacturing, inspection and testing facilities insure that each motor will be built exactly as specified.

For more information on motors that minimize maintenance and downtime, call in your A-C representative, or write for illustrated Bulletin 05B7648. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3852



Raw grinding ball mill in a southern cement plant is driven by this recently installed 600-hp, 100% pf, 150-rpm Allis-Chalmers synchronous motor.

ALLIS-CHALMERS

3 BIG REASONS why the LULL Shoveloader

OUT-VALUES 'em all!

1 **DOES MORE JOBS**

No "one-job" machine, Lull Shoveloader does scores of jobs . . . with equal efficiency. It's quickly and easily equipped for digging, loading, dozing, snow-removing, sweeping, etc. There are no problems of seasonal idleness . . . no wasted hours of standing time!

2 **DOES MORE JOBS BETTER**

Shoveloader's superior performance is no mere boast—it is an established fact, solidly backed by these design features: Double-Acting Bucket Control . . . Power Down Crowd . . . Longer, Higher Reach . . . Finger-Tip Hydraulic Control—plus unobstructed visibility and improved safety for the operator. These features have been proven by State, County and Municipal Highway Departments from coast to coast. Engineered to mount on and utilize the full power of the best industrial wheel type tractors, Shoveloader in no way interferes with use of the tractor for other purposes.

3 **COSTS LESS TO BUY . . . AND TO OPERATE**

When you buy Shoveloader, you save two ways: (1) the total cost of Shoveloader, plus the tractor of your choice, is well below that of so-called "self-contained" units, which furnish engine and loader as a unit. You select the tractor yourself from four popular makes (Minneapolis-Moline, Case, Oliver or Sheppard, each available in several models). (2) Low as Shoveloader's first cost is, it is returned to you many times over in work performed, profits earned, and expense saved.

THIS BULLETIN gives complete data on Lull Shoveloader. Have you received your copy?

MAKE US PROVE SHOVELOADER'S GREATER VALUE! See your Lull Distributor today for an actual demonstration. Or write direct for full information.

LULL Manufacturing Company
356 W. 90th Street • Minneapolis 20, Minn.

coverage alone is not enough

In packaging, your product requires more than *just* coverage. It requires a container that assures the best protection for your product, the best acceptance of your product. Your Chase Salesman is technically trained to study your packaging requirements—and to recommend the specific container that is designed to meet your particular needs.

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VOL. 45 NOVEMBER 1952 No. 5

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PIT AND QUARRY

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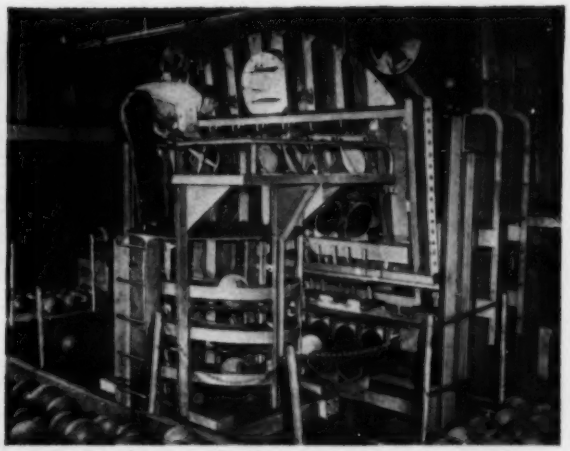

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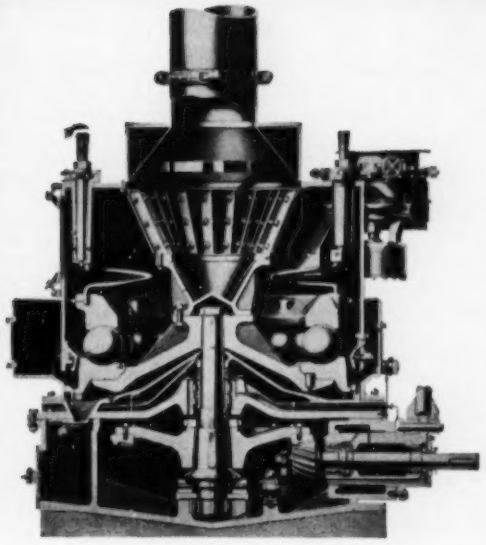

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The Babcock & Wilcox Company, Boiler Div., Process Equipment Dept., 161 East 42nd St., New York 17, N. Y.

editorial

Reduce Accidents—Or Else!

THE final report of the National Safety Council on accidents in industry in 1951 presents a mixed picture for the nonmetallic minerals industries and for industry in general. Of the 41 basic industry classifications 23 reduced their frequency rates and 17 reduced their severity rates from the 1950 level. The 1951 accident frequency rate for all industries, based on the number of disabling injuries per 1,000,000 man-hours, was 9.06, a 2 percent drop from 9.3 in 1950. The 1950 accident severity rate for all industries, based on the number of days lost per 1,000 man-hours of exposure, including charges for permanent disabilities and deaths, was 0.97—a 3 percent increase from the 0.94 figure in 1950.

In the nonmetallic minerals industries the accident frequency rate was down sharply in each of the three industry classifications, but only the cement industry showed a drop in the severity rate from 1950. The cement industry again had by far the best record in this field, with an accident frequency rate of 4.22 and a severity rate of 1.84. These were reductions of 13 and 3 percent, respectively, from 1950. As a result the cement industry moved up from sixth to third place in frequency and from 34th to 33rd place in severity among the 41 industries listed.

The quarry industry had a sharp drop in accident frequency but an even greater increase in severity. The frequency rate was 15.40, a drop of 16 percent from 1950 and the severity rate was 4.54, an increase of 52 percent. As a result the quarry industry moved up from 33rd to 30th place in the frequency column and down from 36th to 39th place in tie severity column. No explanation has as yet been given for the sharp increase in the severity rate.

MINING, other than coal, had a mixed year, with a sharp drop in the accident frequency rate and a somewhat larger increase in the severity rate. The frequency rate was 22.09, a drop of 14 percent from 1950, and the severity rate was 4.14, an increase of 27 percent. This moved it up from 38th to 36th place in both categories. The mining category consists chiefly of metal mines but includes also the many industrial minerals or so-called miscellaneous nonmetallic mineral industries, many of which are comparatively small operations.

These records are not impressive and show ample room for improvement. However, in comparison with other industries which are comparably hazardous they show up much better, indicating that at least as good a safety job is being done as in those several industries. Many nonmetallic minerals producers, large and small, and particularly those who participate in the safety contests of associations of which they are members, are making remarkable individual safety records. As in all fields of endeavor, however, there are others whose bad records offset the good, and it is these producers who must be brought into line. The associations can help by seeing that all their members enter their contests. Less than half the members of most associations now participate in their contests, and it seems obvious that lack of interest and poor safety conditions are the reasons for such wide non-participation.

THE association staffs in most cases have undoubtedly brought as much pressure to bear as possible to get non-participants into these contests, so other means must be found. One answer would be for other participating members to put on pressure, which they can do with more impunity. The association staffs could help the non-participating members get their organizations and operations in such shape that they need no longer hesitate to enter these contests for fear of showing up badly.

All members of an industry have a stake, in addition to the humanitarian one, in the safety record of that industry as well as in the record of industry in general. Poor accident records are usually accompanied by poor industrial relations, low employee morale and high employee turnover. They inevitably result in high insurance and operating costs. There is now also the threat that, if industry does not take immediate action to reduce the accident toll throughout all its branches, government will take over and see that the job is done. Unions also are showing increasing interest in the safety of their members and may either act directly or bring pressure on the government to do so. In either case control of industry would pass still further from the hands of the employers into those of the government and the unions.

THE imminence of government intervention in safety is evident from a recent statement by Lea P. Warner, safety director of the Warner Company and immediate past chairman of the Cement and Quarry Section of the National Safety Council.

"I have been asked to express my personal thoughts about the President's Conference on Industrial Safety held in Washington on June 2-4, 1952.....

"Several years ago at the 1948 NLA Operating Meeting in Chicago I had the pleasure of speaking on safety—I think that I pointed out that if industry did not do a good job, other forces would endeavor to step into the picture and do it for them.

"At this writing I can only warn you that the 'noose' is tightening. At this latest Conference in Washington all of the large company safety directors, some vice-presidents, and hundreds of other representatives from large and small companies were present. Every union had its chance to put industry on the spot and proceeded to do so freely. . . .

"Eventually, government, both federal and state, will roll in on the high-frequency plants and their recommendations may well be costly. Unions will start some kind of a program to hit at the industries whose records are bad."

Walter E. Trunkle

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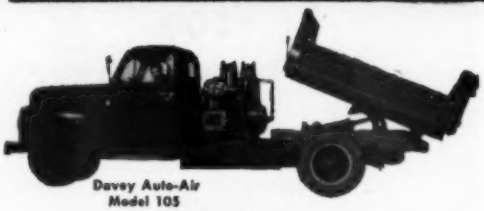

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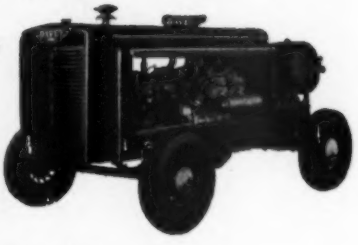

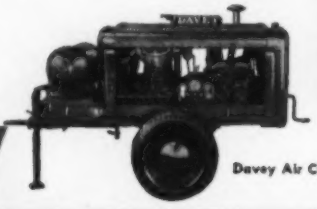

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news of the industry

PIT AND QUARRY

Five Canadian Concerns To Build $5,000,000 Plant In Northern Pakistan

Canada's first consortium company—a combine formed when a single firm is unable to provide the requirements for some diversified operation—was organized recently to build a $5,000,000 cement plant in northern Pakistan.

The following five concerns have put their talents and resources into a pool to execute the project: Dominion Bridge Company, Ltd.; Canadian General Electric Company, Ltd.; Dominion Engineering Works, Ltd.; Fraser-Brace Engineering Company, Ltd.; and H. G. Acres Company. S. W. Andres of the last-named firm is president, W. D. Jewett is vice-president, and S. D. Lewis is secretary. Mr. Jewett and Mr. Lewis are both of the Dominion Bridge Co.

The plant will be constructed chiefly by Dominion Bridge and will be shipped in sections to Pakistan. Funds are provided by the Canadian government as a contribution to the Colombo Plan in the British Commonwealth for combating Communist influence through economic assistance to undeveloped areas.

Canadian officials found an almost unlimited supply of raw materials in Pakistan for the manufacture of badly needed cement. The shortage of living accommodations has been aggravated because of the flight to Pakistan of large numbers of Moslems after the partition of India. An additional need for cement has been created by plans for irrigation and power projects.

A.S.T.M. Promotes R. J. Painter, R. E. Hess to New Posts

The American Society for Testing Materials has elected Robert J. Painter as executive secretary of the Society and Raymond E. Hess as associate executive secretary and editor-in-chief, both promotions effective September 16. This action was taken by the board of directors following a report of a special committee which had been appointed to recommend a successor to the late C. L. Warwick, long-time executive secretary of the Society, who died on April 23.

Both men have been members of the A.S.T.M. for many years. Mr. Hess has been assistant executive secretary and editor, and Mr. Painter most recently has been treasurer and assistant secretary.

The new executive secretary received his degree of Civil Engineer from Rensselaer Polytechnic Institute in 1928. Following a period on the R.P.I. faculty, he was associated with the Bethlehem Steel Company. He joined the A.S.T.M. staff in 1931.

Mr. Hess is a graduate of the University of Pennsylvania in civil engineering. Following a short period with Day and Zimmermann, Incorporated, he became a member of the A.S.T.M. staff in 1920.

Officials of the Gravel Products Corporation, Buffalo, N. Y., have announced the completion of the firm's new office building and garage in that city. According to President E. M. Hammond, the cost of the structure is approximately $100,000. The garage on the first floor has 10,000 sq. ft. of floor space and will house 24 big mixer trucks. Offices are on the second floor.

N. L. A. Names Lea Warner Chairman of Committee To Draw Up Safety Code

Lea Warner, safety director of the Warner Company, was appointed by the National Lime Association's board of directors in October, 1950, to head a special committee to develop a set of safety standards for the lime industry.

Mr. Warner has reviewed many safety codes and standards of other industries for ideas and suggestions. He has completed the first rough draft of the lime industry safety standards.

The special committee developing the lime industry safety standards is composed of the following members: Lea P. Warner Jr., Warner Company, chairman; M. C. M. Pollard, National Gypsum Company; Frank R. Dittoe, The Kelley Island Lime and Transport Co.; L. L. Huck, Mississippi Lime Company; and L. N. Carmouche, The Dow Chemical Company.

Coming Events

November 12 and 13, 1952—Washington, D. C. 35th annual meeting, National Slag Association. Mayflower Hotel.

January 18-21, 1953—Washington. Annual convention, National Agricultural Limestone Institute, Inc. Hotel Statler.

January 25-29, 1953—Cleveland. 33rd annual convention and exhibit, National Concrete Masonry Association. Public Auditorium.

February 2-6, 1953—New York. 36th annual convention, National Crushed Stone Association. Hotel New Yorker.

February 16-19, 1953—Los Angeles. 175th general meeting, American Institute of Mining and Metallurgical Engineers. Hotel Statler.

February 23-26, 1953—San Francisco. 37th annual convention, National Sand and Gravel Association. Hotel Fairmont.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

February 25, 1953—Dallas. Fourth annual convention and meeting, American Concrete Pressure Pipe Association. Baker Hotel.

February 26, 1953—Dallas. Third annual convention and meeting, American Concrete Agricultural Pipe Association. Baker Hotel.

February 26-28, 1953 — Dallas. 45th annual convention and meeting, American Concrete Pipe Association. Baker Hotel.

March 4 and 5, 1953 — Des Moines. Eighth annual convention, Iowa Agricultural Limestone Association, Inc. Savery Hotel.

McCrady-Rodgers Co. Sells Controlling Interest To Rudolph & Associates

Samuel C. Rudolph and Associates of Los Angeles, Calif., have acquired controlling interest in the McCrady-Rodgers company, a large building materials and construction firm of Pittsburgh, Pa. According to William F. McCrady Sr., president of the Pittsburgh firm, present management will remain.

Financial arrangements were not disclosed, although it is expected that the sale involved a stock transaction of several million dollars.

McCrady-Rogers, operating several producing and distributing plants in the Pittsburgh area, specializes primarily in sand and gravel and ready-mixed concrete. The company was formed in 1929, resulting from a merger of J. H. McCrady and Brother, a builder's supply firm founded by the late J. H. McCrady in 1870, and the Rodgers Sand Company, founded by the late Captain William B. Rodgers in the early 1890's.

The McCrady firm began construction work about 1893, and is one of the oldest construction firms in Pennsylvania.

Empire State S.G.-R.M. Assn. Convenes at Poughkeepsie

On October 15 the Empire State Sand, Gravel & Ready Mix Association held its fall meeting at the Nelson House, Poughkeepsie, N. Y. After the rountine reports at the luncheon a panel session on sand and gravel was held with Harry A. Barney as moderator. Those participating were George R. Krom, president, Windsor Building Supplies Co., Inc., Newburgh, N. Y.; Edward J. Nunan, Buffalo Slag Co., Buffalo, N. Y.; and Thomas P. Eldred, Jr., American Hard Wall Plaster Co., Utica, N. Y. At the dinner meeting the speaker was Alex J. Yeaps, structural field engineer for the Portland Cement Association.

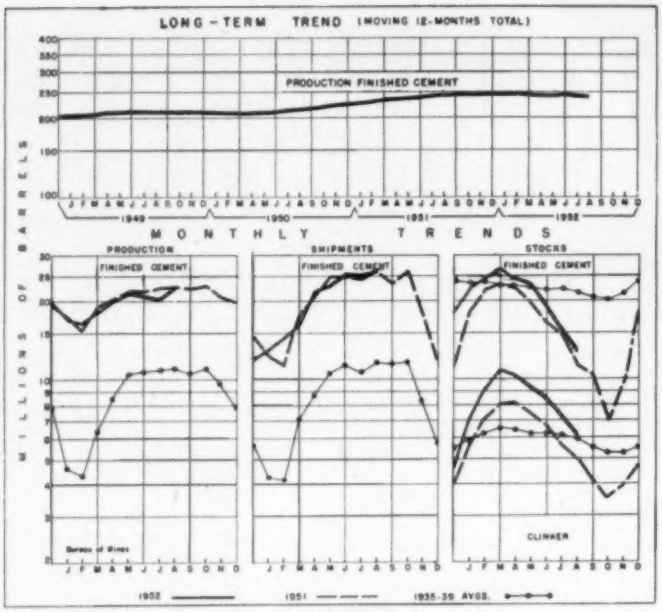
A trip through the plant of Mr. Krom was arranged for the members on the following day. The possibility of holding a two- or three-day short course on Cornell campus in January was discussed.

W. L. Huber Elected President Of A.S.C.E. for 1952-1953

With the completion of a mail ballot of its more than 35,000 members, the American Society of Civil Engineers has elected Walter L. Huber of San Francisco as president for one year. He was inducted, along with two newly-elected zone vice-presidents and eight district directors, at the Society's annual business meeting held October 15 in the Statler Hotel, New York.

Mr. Huber, who succeeds Col. Carlton S. Proctor of New York, the Society's centennial-year president, is a graduate of the University of California and a former vice-president and director of the Society and a former president of its San Francisco section. He has had a distinguished career in engineering important hydraulic and structural projects.

The new vice presidents, named for two years, are Edmund Friedman of Coral Gables, Fla., for Zone II (eastern and southeastern U. S.), and G. Brooks Earnest, president of Fenn College, Cleveland, Ohio, for Zone III (midwestern U. S.).



SUMMARY—Production of finished portland cement in August, 1952, totaled 23,573,000 barrels, as reported to the U.S. Bureau of Mines, representing a 5 percent increase over the August, 1951, figure. Mill shipments totaled 25,915,000 barrels—a decrease of 0.3 percent, as compared to shipments in August, 1951, while stocks of 12,816,000 barrels of finished portland cement were 12 percent greater than those of one year ago. Clinker production during the month totaled 22,233,000 barrels—1 percent more than in August, 1951.

PRODUCTION—One hundred and fifty-five (155) plants located in 37 states and Puerto Rico reported a production of 23,573,000 barrels of finished portland cement during the month, as compared to 151 plants which manufactured 22,514,000 barrels in August, 1951. Clinker production during the month totaled 22,233,000 barrels—1 percent more than in the preceding August.

SHIPMENTS—Mill shipments of finished portland cement were 0.3 percent more than in August, 1951, and totaled 25,915,000 barrels. Shipments were greater in 8 districts and lower in 11 districts, as compared to shipments in August, 1951. The percentage changes range from a 47 percent increase in the Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi district to a decrease of 12 percent in Michigan. Other districts reporting marked increases in shipments were Iowa, Western Missouri-Nebraska-Oklahoma-Arkansas, and Kansas.

STOCKS—Mill stocks of 12,816,000 barrels of finished portland cement were reported at the end of August, 1952—12 percent greater than on the same date a year ago, while stocks of clinker amounted to 6,097,000 barrels—26 percent greater than on August 31, 1951.

Asbestos Corp. of Montreal Reports Continued High Output

Maintaining its record sales-and-earnings pace of last year, Asbestos Corporation, Ltd., of Montreal, is expected to equal the 1951 profit of $3,901,094, or $2.17 per share. Continuing strong demand for asbestos is expected to result in an increase in tonnage sales, although the demand for extremely short grades of fiber has become selective.

Canada produces about 70 percent of the world's asbestos requirements; and more than 90 percent of Asbestos Corporation's output is for export. The United States is this firm's largest buyer.

Asbestos Corporation is developing its new Normandie mine, which is scheduled to be in operation late in 1954. The cost of the new project, which has ore reserves estimated at approximately 20,000,000 tons, has been tentatively set at $9,750,000. Total reserves of the company were said to be 96,000,000 tons, sufficient for more than 25 years at the present rate of mining.

Americans Observe Methods Of Mining Potash in Europe

Three officials of the Potash Company of America—E. W. Douglass, research director; A. J. Weinig, refinery superintendent; and R. R. Knill, mine superintendent—visited potash mining operations recently in France, Germany, Spain, England, Scotland, and Wales.

In France they found mining in progress 2,100 ft. below the surface. Methods of operation, as well as wage rates, varied widely in the different countries. The visitors from the States found that the flotation process is still in the experimental stage in Germany and France.

Fluorspar Flotation Plant Opened at Fallon, Nevada By Kaiser Aluminum

The Kaiser Aluminum and Chemical Corporation began operation of a new fluorspar flotation plant near Fallon, Nev., in September. The new plant has a daily capacity of 100 tons of ore, from which 30 to 50 tons of concentrates is produced per day. Crude fluorspar for the plant is shipped in from the recently purchased Baxter mine located in the Broken Hills district, about 70 miles southeast of Fallon.

Kaiser Aluminum purchased the mine a few months ago from H. W. Gould and Company of San Francisco for a reported price of approximately $350,000. The Baxter, worked to 350-ft. depth, is said to contain about 500,000 tons of developed fluorspar, and diamond drilling by the U. S. bureau of Mines in 1950 indicated deposits persist to greater depths. A leading Nevada producer of high-grade fluorspar since 1932, the Baxter operation consists of five shafts, three winzes, crosscut and other underground workings.

Concentrates from the new mill will be shipped to Nichols, Calif., for additional treatment. Daily output of concentrates will depend upon the grade of fluorspar obtained from the mine. It is understood that the capacity of the plant may be expanded later to handle custom ore and fluorspar from other company mines.

H. S. Foster is general superintendent of operations at the Fallon mill. Jay Shoemaker is mill superintendent. Approximately 40 men are on the corporation's payroll.

Traylor 50th Anniversary Marked by Golden Log Book

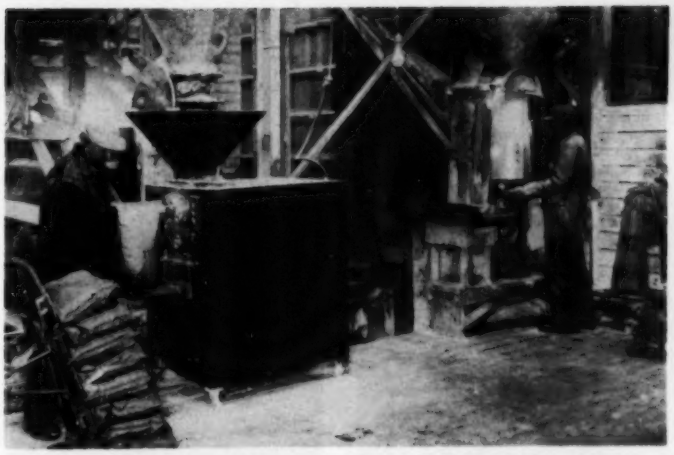
The Traylor Engineering and Manufacturing Company, Allentown, Pa., which is this year celebrating the 50th anniversary of its founding, has published an attractive blue-and-gold bound book entitled *Our Golden Anniversary Year*.

From the organization of the Traylor enterprise in 1902 by Samuel W. Traylor Sr. through the 50-year span the development of the company is chronicled and pictured. Many of the firm's products are pictured and described; and photographs of its personnel, from President William J. Roberts Sr. to department heads, are featured.

Control of United Feldspar Sold to Pennsylvania Firm

Acquisition of 85 percent of the outstanding stock of the United Feldspar & Minerals Corporation of New York by the American Encaustic Tiling Company of Lansdale, Pa., was announced recently. The price involved was not disclosed.

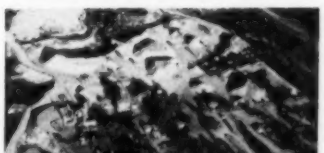
United Feldspar & Minerals operates mines in Maine for the processing of feldspar; it also owns three mines in North Carolina which produce various grades of pyrophyllite.



• By means of two new Auger-matic Packer machines at the Metro-Nite Company's pigment plant in Milwaukee, Wis., bagging operations formerly requiring five men now are performed by three. In the picture above, the man at the left, operating an Auger-matic, has filled and weighed 11 bags in the time required to fill one bag with the old-style packer at the right. The photograph was made before Metro-Nite installed its second Auger-matic. Manufacturer of the automatic filling and weighing machine is the E. D. Coddington Manufacturing Company, Milwaukee.

Control of United was purchased from Mrs. Winnifred L. Haag, former president, who remains a member of the board of directors. Albert P. Braid succeeds Mrs. Haag as president. Other officers are John Boyd, vice-president; Edward A. Scott, treasurer; and Raymond C. Burdick, secretary and company counsel.

Cover Picture....



• The photo of the month (see cover) shows the operations of the City Rock Company at Sunland, Calif., from the air. A part of the pit is seen at the upper left, the main structure being the sand-and-gravel plant. The hot-mix asphalt plant, the garage, and service and office buildings are near the center of the picture. Just visible near the top is the batch plant (left of center). The batch-plant bins are loaded by a ramp, bulk-cement by a long screw conveyor. Surplus finished aggregates are shown in open storage, and numerous truck-loading bins are spotted around the yard. These are kept filled by a crane, which can also load trucks from the piles. Most of the delivery fleet is shown near the garage. The fleet includes 18 truck-mixers and 24 aggregate trucks and truck-trailer combinations. Capacity of the aggregate plant is 350 t.p.h.

Cement and Gypsum Facilities Sponsored by Newfoundland

A new cement plant and a new gypsum and wallboard plant have recently begun successful operation in Corner Brook, Newfoundland, according to E. A. Leja, chief engineer in charge of construction of the plants and managing director of both companies.

Construction of the two projects during 1951-52 was first financed by the Provincial Government of Newfoundland.

Revised Edition of Monograph On Phosphates Published

The second edition of *Phosphoric Acid, Phosphates, and Phosphate Fertilizers* (American Chemical Society Monograph No. 34) by William H. Waggaman has recently been published. It represents nearly a complete revision from the author's first edition, published in 1927, and was necessitated by the great achievements made in the phosphate industry since that time. Mr. Waggaman is senior mineral technologist of U.S. Bureau of Mines.

This work presents a thorough, up-to-date treatment of the chemistry, technology, and uses of phosphorus. Included are chapters on the location, mining, and recovery of phosphate rock; processes used in making phosphorus compounds; and economic aspects of manufacturing methods, both from the standpoint of the manufacturer and the consumer. The book also contains an appendix giving a complete list of U.S. patents on manufacture and use of phosphorus compounds.

Published by Reinhold Publishing Corporation, 330 W. 42nd St., New York 36, N.Y. 678 pages. $15.00 per copy.

M. D. Catton, D. McHenry Accept New P.C.A. Posts—H. F. Gonnerman Retires

Miles D. Catton, director of development of the Portland Cement Association since 1949, has been appointed assistant to the vice-president for research and development (effective September 1), according to an announcement issued by A. Allan Bates, vice-president for research and development. He succeeds H. F. Gonnerman, who has retired after 30 years of active service with the Association.

Miles D. Catton

Succeeding Mr. Catton as director of development is Douglas McHenry who was previously administrative assistant to Dr. Bates.

Mr. Catton is best known as the author of numerous scientific papers and technical brochures on soil-cement construction and for his pioneering work in this field. Between 1935 and 1940, laboratory and field studies directed by him on the feasibility of scientific control of mixtures of native soil and portland cement were in large measure responsible for the development of this low-cost paving material.

Douglas McHenry

Mr. McHenry joined the Association staff in April of 1952 as administrative assistant to Dr. Bates after 11 years of service with the U. S. Bureau of Reclamation in Denver, where he was head of the Structural Development Section and later chief of its Concrete Laboratory Section. He is nationally known in engineering circles as the author of many notable papers on concrete technology and structural research.

In 1943 he received the Sanford E. Thompson Award of the American Society for Testing Materials, and in 1944 the Telford Award of the Institution of Civil Engineers of Great Britain for papers dealing with structural behavior and research, and concrete design problems.

$1,000,000 Improvement Plan For International Minerals

Directors of International Minerals & Chemical Corporation have approved the expenditure of slightly more than $1,000,000 at the Potash Division's Niagara Falls plant for improvements which will increase production by about 25 percent, according to A. Norman Into, vice-president in charge of International's Potash Division.

Mr. Into explained that most of the money will be spent to replace old equipment with newer and more efficient models.

Johns-Manville Joins Firm To Explore Colombian Asbestos

Johns-Manville Corporation has joined with South American corporations to form a new company, Asbestos Colombianos, S. A., which will explore asbestos deposits in the department of Antioquia, Colombia. South American firms involved are Eternit Colombiana, S.A., Sociedad Colombiana De Asbestos, Ltda., and the Institute De Fomento Industrial.

Johns-Manville will furnish technical personnel for exploring the Antioquia deposits to determine their economic value, and if the exploration results are favorable, the company will design a mill to produce asbestos fiber.

A new process for making lightweight aggregate from electric furnace phosphorus slag has been developed by the Tennessee Valley Authority. The process involves tapping molten slag from the furnaces into a hearth and simultaneously adding steam and water. This expands the slag to a porous mass which can be crushed to size after cooling. Several private companies are considering producing the aggregate on a commercial scale.

Construction Totals Rising In Midwest and East—Nine-Month Showing Good

Construction contracts awarded in the 37 states east of the Rockies for the first nine months of 1952 were 2 percent higher than in the corresponding period a year ago, it was reported by F. W. Dodge Corporation, construction news and marketing specialists. This, despite inclusion in 1951 figures of $980,000,000 in Atomic Energy Commission project awards. Without these awards in the comparative 1951 figures, the current year is running 10 percent ahead of last year. The nine-month 1952 awards total is $12,747,791,000.

Construction awards for the month of September showed a new surge of building activity with a total of $2,039,203,000, which was 42 percent more than in August and a whopping 88 percent greater than in September, 1951.

Individual classifications for September showed non-residential awards of $1,272,367,000, which were 145 percent more than the August figure and 215 percent over that of September, 1951. Residential awards totaling $518,471,000 were 17 percent less than for August, but 8 percent more than for September last year. Public and private works and utilities at $248,365,000 were 15 percent below the August figure, but 25 percent above that of September, 1951.

Comparing nine-month 1952 totals with those of 1951, non-residential at $5,053,968,000 was down 8 percent. (Note: Less AEC awards included in 1951, this year was up 12 percent); residential at $5,098,182,000 was up 4 percent; public and private works and utilities at $2,595,641,000 gained 22 percent.

R. Snow Wilson Jr. Dies At 48 of Heart Seizure

R. Snow Wilson Jr., 48, vice-president of the Big Rock Stone and Material Company, Little Rock, Ark., died September 30 of a heart attack at a Little Rock hospital. He had been undergoing treatment for a heart ailment for some time.

The Big Rock company was formed by Mr. Wilson's father, the late R. S. Wilson, who died last February. In September, 1950, the company was purchased by the Minnesota Mining and Manufacturing Company for operation as a wholly-owned subsidiary; Mr. Wilson and his father remained in their executive positions.

During World War II Mr. Wilson served in the Air Transport Command with the rank of colonel.

On November 12 and 13 the thirty-fifth annual meeting of the National Slag Association will be held at the Mayflower Hotel in Washington, D. C. Carl A. Carpenter, senior materials engineer, Bureau of Public Roads, will be the guest speaker at the luncheon on the first day. The annual meeting of the board of directors will be held in conjunction with the convention.

Permanente Stockholders Form Kaiser Gypsum Co., Vote Pacific Coast Merger

Permanente Cement Company stockholders recently voted approval to purchase the business and assets of the Kaiser Gypsum Division of the Henry J. Kaiser Company, manufacturers and distributors of gypsum building products in the western states.

It was voted to transfer the gypsum properties as of August 1, 1952, to a new wholly-owned subsidiary of Permanente, to be known as the Kaiser Gypsum Company.

Permanente stockholders also voted to merge the inactive subsidiary, the Pacific Coast Cement Corporation, into Permanente.

Barrett Line Quarries Sold To Tennessee Corporation

Sale of the Barrett Line Quarries, Inc., Cincinnati, Ohio, including two limestone quarries in Cape Girardeau County, Mo., and one in Livingston County, Ky., was announced recently by Slack Barrett, president. All the common stock of the firm was purchased by Cape Girardeau & Smithland Quarries, Inc., a Tennessee corporation. The purchase price was not disclosed.

This transaction dissolved the last of the Barrett companies. Barrett Line, Inc., a steamboat transportation company, was sold last summer to the West Tennessee Limestone Company, Inc., Nashville, Tenn.

Sierra Talc & Clay Co. Opens New Plant at Grand Island

The Sierra Talc and Clay Company, Los Angeles, Calif., which is undergoing an expansion program, recently opened a new $500,000 talc mill at Grand Island, Nebr. The mill, Sierra's fourth, will process raw talc from the company's mines in Nevada, California, and Montana. The principal talc source will be the firm's Yellowstone mine near Morris, Mont., which is reported to contain the largest supply of high-purity steatite talc ever developed.

According to Henry Mulryan, executive vice-president of Sierra, the mill was located at Grand Island because of the strategic rail location and because it is away from known industrial target areas. Finished talc products will be shipped to Midwestern and Eastern markets.

Marquette's Annual Report Does It Again—First Prize

For the eighth consecutive year Marquette Cement Manufacturing Company has won honors for excellence in annual reporting. The independent board of judges in the Financial World Annual Report Survey today announced its finding that Marquette's 1951 annual report is best in the cement industry. The bronze "Oscar of Industry" trophy was presented to the company at the Annual Awards Banquet in the Grand Ballroom of the Hotel Statler, New York, on October 28.

A total of 5,000 reports were considered this year in the international competition, the twelfth in the series of surveys. These reports were judged in 100 industrial classifications for the "Best of Industry" awards. In the cement industry the Permanente Cement Company was runner-up for top honors, while the Lone Star Cement Corporation placed third.

Kenneth A. Gutschick Joins Pit and Quarry Staff

PIT AND QUARRY has welcomed a new field editor, Kenneth A. Gutschick, formerly with Material Service Corporation of Chicago, to its editoral staff.

Ken's training and experience represent a good background for his new position. During his year with Material Service he underwent extensive quarry supervisory training. He spent most of his time at large quarrying operations in Thornton and Lyons, Ill., where he worked at a variety of jobs, particularly blasting. He also observed lime, refractory dolomite, ready-mix concrete, and related operations.

At the University of Chicago Ken received a Ph. B. in 1946, and S.B. and S.M. degrees from the department of geography in 1948 and 1950, respectively. His major fields were physical and economic geography, and his master's thesis was a study of the major nonmetallic mineral building material industries of the Chicago area.

During and following his academic training Ken was a geology instructor at the University of Notre Dame, where he taught physical and historical geology courses. Also during this period he worked in the heavy construction field for John Griffiths and Son Company, Chicago.

Ken served for over three years in the Air Corps, a part of this time in a meteorology training program and the remainder as a weather observer. He spent 15 months in the Middle East.

Kenneth A. Gutschick

National Gypsum Company To Use $25,000,000 Loan In Expansion Program

Chairman Melvin H. Baker of the National Gypsum Company has revealed details of a new 25-year, $25,000,000 loan arranged with the Mutual Life Insurance Company of New York, the John Hancock Life Insurance Company, and the Northwestern Mutual Life Insurance Company. He stated that about $18,500,000 of the loan will be used to pay off the company's present debt, under which there is a commitment to retire the principal of about $2,000,000 annually.

Approximately $6,500,000 will be left for capital expansion, according to Mr. Baker. Current plans call for technological improvements, new products, an office addition and the proposed new Buffalo research center.

El Apache Sulphur Mine Open For Full-Time Production

Minerales Industriales of Baja California (Mexico) is opening the El Apache Sulphur Mine, 25 miles south of the village of San Felipe on the Gulf of California, for full-time production for an anticipated 10-year period.

According to George R. Allen, president, all construction work, including housing facilities for miners and their families, has been completed.

1951 P.C.A. Safety Award Won by Penn-Dixie Plant

Penn-Dixie Cement Corporation, Bath, Pa., was recently awarded a trophy by the Portland Cement Association for a perfect safety record during 1951. The trophy stands 6 ft. high and weighs 4½ tons.

This was the third award received by the Bath plant this year. Other awards were a certificate of commendation presented by the National Safety Council and a certificate of honor from the Pennsylvania Department of Labor and Industry.

A perfect safety record has been maintained by the Bath plant, which employs 250 persons, since September 20, 1950.

According to reports from Ottawa, Canada, all previous records of production were exceeded in 1951 by Canada's cement plants. Shipments totalled 17,007,812 bbl., valued at $40,446,288, as compared with the 1950 output of 16,731,826 bbl., valued at $35,894,124. The 1951 shipments were more than double the 1945 total of 8,471,679 bbl.

Clint A. Allen, executive secretary of the Iowa Agricultural Limestone Association, Inc., has announced that plans are under way for the organization's eighth annual convention. Sessions will be held at the Savery Hotel, March 4 and 5.

• Cutting a slice 150 feet wide and 700 feet deep from the top of a mountain to its base was the first step in the lime quarry expansion program recently undertaken by the Santa Cruz Portland Cement Company, Davenport, Calif. Granite Construction Company, Santa Cruz, Calif., contractor for the job, used five International TD-24's with scrapers to remove over 400,000 cubic yards of clay and shale. This material will be used to fill a ravine before sandstone is reached and blasting operations begin.

Big Bauxite Refining Plant Opened by Aluminum Ore Co.

The Aluminum Ore Company, a subsidiary of the Aluminum Company of America, began producing alumina on a 24-hr. operational basis at its huge new bauxite refining plant at Bauxite, Ark., in October. The plant, which is still under construction, is expected to cost about $42,000,000 when it is completed late this year.

Covering more than 125 acres, the new plant will have a peak annual production of 800,000,000 lb. of alumina and will employ about 700 persons. Bauxite mined in Arkansas will be used exclusively.

Partaking in the ceremonies of the plant dedication were Allen B. Williams, St. Louis, president of Aluminum Ore Company, and Lawrence Litchfield Jr., Pittsburgh, Pa., president of the Alcoa Mining Company.

Ozark-Mahoning Developing $1,000,000 Fluorspar Deposits

About five miles north of Cowdrey, Colo., at North Park the Ozark-Mahoning Company of Tulsa, Olka., now has in operation a $1,000,000 fluorspar mining development. The processed material is shipped directly from the plant to the railroad at King's Canyon, Colo.

In charge of the firm's western division headquarters is R. K. Wisco. M. P. Cloonan is superintendent of the plant. Ozark-Mahoning also operates properties at Jamestown, Colo., and Deming, N. M.

$2,000,000 Business Develops From Old Limestone Quarry

More than 600 persons recently attended the formal opening of the $2,000,000 refrigerated warehouse in a worked-out underground limestone mine at Loring, Kan. The venture is operated by the Natural Storage Company, Inc.

Visitors were taken through various sections of the cave by an electrical multicar train. The entire warehouse has a capacity of 1,200 carloads of food and has a natural temperature of 55 degrees.

Guy E. Stanley Jr., principal owner of the warehouse, began mining rock from an old quarry near the site in 1946, assisted by E. P. Conlan, who is vice-president. J. R. Carlgren is secretary.

Death Takes Thomas J. Best, Pioneer of Gypsum Industry

Thomas J. Best, 89, father of the gypsum industry in Medicine Lodge, Kans., died recently in a Wichita hospital. A native of England, Mr. Best founded the first gypsum mill at Medicine Lodge in 1889, and operated it under the name Best Bros. Keene's Cement Company, until selling out in 1927. This plant was also the first gypsum plant to be built west of the Mississippi River. In the 30's National Gypsum Co. bought the plant and expanded it into a multi-million dollar program completed last year.

Mr. Best had devoted practically his entire life to the gypsum industry. He spent his early years in Westmoreland, England, where his father owned several gypsum quarries. He moved to Medicine Lodge in 1889, where he built the first gypsum mill, and lived there until his death.

The Venezuelan Cement Company, Caracas, Venezuela, has been granted a $4,000,000 loan by the United States Export and Import Bank to help expand the firm's Pertigalete plant. The expansion, which is to be completed at a cost of $12,000,000, is expected to increase production from the present 85,000 tons to about 480,000 tons a year.

Frank R. Cadman Named Assistant to President Of Warner Company

Frank R. Cadman, who has been industrial relations manager for The Warner Company since 1943, was recently appointed assistant to the president. He will carry out special assignments for John Curtin Jr., to relieve him of a portion of his responsibilities. He will continue in charge of the industrial relations department, supervising employee communications, safety, personnel problems, and labor relations.

Mr. Cadman joined the Warner Company in 1941 as assistant industrial relations manager. Previously he had been associated with the Seattle Gas Company. In addition to his affiliations with Philadelphia industrial relations groups, he is presently serving on the industrial relations committee of the Pennsylvania State Chamber of Commerce. He is also a member of the National Labor-Management Committee for Defense Manpower for the Third Region (Pennsylvania and Delaware).

Important Notice on Percentage Depletion

The Commissioner of Internal Revenue has finally released the amendments he proposes to make in Treasury regulations in view of the Congressional extension of percentage depletion to sand and gravel, industrial sand, crushed stone and other nonmetallic minerals. The proposed amendments to Regulations 111 and 130 were published in the Federal Register of October 29, 1952. These amendments are not final and interested persons are granted 30 days from October 29, 1952 within which to file objections and suggestions. They may also request a conference with the Commissioner in which they will have the opportunity to present their views in person. Ordinarily no conference will be granted unless it is requested in writing within the 30-day period.

The percentage depletion committees of the various associations are holding meetings early in November to decide whether protests should be filed with the Commissioner and, if so, what provisions should be protested. The committees will also decide whether additional amendments should be proposed. Members and non-members of these associations have been requested to advise them of any suggestions with respect to modification of the tentative regulations. All producers will be informed of the decisions arrived at by these committees. As in similar cases in the past these associations are acting for the benefit of their entire industries, not for their memberships alone. Any producer, member or non-member can, however, if he desires, present suggestions direct to the Commissioner of Internal Revenue, Washington, D. C. Copies of the October 29, 1952, issue of the Federal Register containing the proposed changes, and copies of the Revenue Act of 1951 containing the original regulations can be seen at most public libraries, universities and colleges.—The Editor.

Gypsum, Gypsum Products Show 10 Percent Decline In 3rd Quarter Period

Domestic mine production of crude gypsum during the second quarter of 1952, as reported to the U. S. Bureau of Mines, was 2,067,003 short tons—10 percent less than in the second quarter of 1951. Production of calcined gypsum was 13 percent less than in the same period last year. All gypsum products except sanded plasters and dental and orthopedic plasters showed declines from the second quarter of 1951. Appreciable losses were registered by fillers and unclassified uncalcined products, mixing-plant plasters, tile, prepared finish plasters, and plate-glass and terra-cotta plasters. Declines of 15 percent and 10 percent, respectively, were noted for portland-cement retarder and agricultural gypsum.

Among the prefabricated products, lath production was 21 percent less than in the same quarter of 1951, while the output of wallboard and laminated board was 6 percent under last year's second quarter total.

Every classification of gypsum and gypsum products except one shows a lower total for the first six months of 1952 than for the first half of 1951. The exception is in sanded plasters, which increased 31 percent. Perlite premixed plasters are currently included in sanded plasters.

• When two of the Manegold Stone Company's trucks were retired from service recently at the firm's quarry near Milwaukee, Wis., an unusual air-lift operation brought them to the surface and deposited two new units on the quarry floor, 160 ft. down. The worn-out trucks had been in service for 10 years and had traveled 60,000 miles in an area 800 by 450 ft. square (covering about seven and a half acres). In this picture one of the two new 7-ton trucks is shown being lowered to the floor by a truck-mounted crane. It will be used to transport rock to a hoist which lifts the material to the crusher at the surface.

The Barber-Greene Company's new office building at Aurora, Ill.

New Mexican Cement Plant To Be Built in Torreon Area

With an abundance of prime materials for production of cement in the mountains surrounding Torreon, Mexico, a new cement plant is to be constructed with Nacional Financiera granting credits to a group of local industrialists for the purpose. The semi-official government finance agency has restricted production to 300 tons instead of a requested 500 tons daily so that no "unfavorable competition" is given other producers who must pay shipping charges for prime materials.

It is claimed that white cement can be produced cheaply in Torreon by utilizing the gypsum from deposits near the village of Coyote.

Cement Industry Asks OPS For Adequate Price Increase

The nation's cement industry has petitioned the Office of Price Stabilization for sufficient price relief to cover increased costs in industry since January 1, 1951, according to Gordon Tongue, president of the Northwestern Portland Cement Company and a member of the OPS cement industry advisory committee. OPS promised to give the request consideration.

The last price increase granted to the industry was in September, 1950. According to Mr. Tongue, the increase is justified because cost of materials has gone up considerably and wage increases in the last two years have been the heaviest in the industry's history.

New Aurora Office Building Opened by Barber-Greene Co.

Barber-Greene Company, Aurora, Ill., which manufactures conveyors, loaders, ditchers and asphalt mixing and paving equipment, has just moved into a new office building near the main plant in Aurora.

The building is 250 ft. long and has three full floors with almost 55,000 sq. ft. of office space. It is of reinforced concrete construction with brick facing and is built in the form of a shallow "L."

American Rock Wool Buys Feltrock Insulation

The American Rock Wool Company, Wabash, Ind., has acquired the Feltrock Insulation Manufacturing Company of Tacoma, Wash.

The Feltrock plant was built during the war for the manufacture of carbide and was converted to mineral wool production when the original product was no longer needed. It is located on a main highway and is connected by a slip with water transportation. The plant will manufacture rock wool from copper slag. The Feltrock sales organization will continue to act as distributor for American Rock Wool, and the office and plant employees will be retained.

The Tacoma plant is the seventh in the company's manufacturing operations. Jim Tillman, plant engineer at the Torrance, Calif., plant, has been named plant manager, and Maurice Haney, who was trained in traffic and sales, has been transferred to the plant from Wabash, Ind.

Under a recent Wage Stabilization Board ruling, some 390 employees of the Lone Star Cement Corporation plants at Houston and Dallas received a ten-cent hourly pay hike, retroactive to Feb. 1. The new wage agreement has the approval of both the company and officials of the United Stone and Allied Products Workers of America, CIO. In the ruling, the WSB approved a third-week paid vacation for all company employees having 25 years or more service and shift differentials of 6c and 9c an hour for afternoon and night shifts.

Danger! Handle with Care! Applies to Compressed Air

A recent issue of the *Safety News Letter* of the Cement and Quarry Section, National Safety Council, carried a safety sidelight which was quoted from the *National Lime Association Safety Letter*. Because it is of vital interest to workers in the nonmetallic mining industries, we relay the item to our readers:

"The use of compressed air in industrial plants to blow off dust and other foreign matter from the workers' clothing is a common practice. While this method affords an easy means of removing lime and other dust from clothing, everybody should be instructed that this is a dangerous practice. Every year a number of accidents involving the compressed air brush-off occur.

". . . Under a pressure of 80 to 100 lb. an air jet can really kick dust particles around with force. Most of the dust would be removed, but particles could be driven into the pores or land in the eyes and on other sensitive body areas. Skin irritation, burns, the possible loss of an eye are potential accidents a careless employee can expect from using compressed air to clean his clothing.

"Another type of compressed air accident is that resulting from horseplay. Many workers have been blown to death when either they or some prankster (who ought to have known better) has directed an air jet into the body openings. The body is not designed to withstand high internal pressures, so Joe literally 'blows his top' under such dangerous horseplay.

". . . The use of compressed air should be prohibited in dusting off clothing, and all compressed air outlets currently used for such purpose should be locked-out. On the other hand, brushes should be provided for the employees to use to remove dust. A vacuum device might also be equally as effective in removing dust as compressed air. (Suggestion: a second-hand vacuum cleaner might be conveniently converted for such use by an enterprising safety engineer and mechanic.)"

Cement Output in Mexico Normal After Shortages

The Mexican cement market has returned to normal after months of scarcity, according to the National (Mexican) Chamber of the Cement Industry. Private and federal construction has resumed round-the-clock work on projects. The industry association states that increased production, approximating 5,000 tons a day, and completion of such tremendous federal projects (or seasonal suspension during the rains) as University City, the Papaloapan dam, etc., have eased heavy demands on the cement industry.

Improved transportation facilities for materials and fuel, as well as better cement distribution methods, have been noted, the Chamber stated.

Tuberculosis can be cured and prevented —if proper measures are taken. Because this is true, it is imperative that the work supported by the sale of Christmas seals, sponsored by the National Tuberculosis Association, be continued until the complete eradication of the disease has been accomplished. The 46th annual Christmas seal sale of the voluntary tuberculosis associations will be conducted from November 17 to December 25. Do your part by purchasing and using 1952 seals.

Federal Portland to Double Cement Storage Capacity

Federal Portland Cement Co., Inc., will increase its cement storage capacity by 50 percent at its plant in Buffalo, N. Y. The work will involve an expenditure of approximately $350,000.

A contract has been awarded the Shirley-Herman Co. for the erection of four additional silos, which will have a capacity of 25,000 barrels each. The silos will be 34 ft. in diameter and 104 ft. high. Erected on concrete piers, so that loading trucks can drive underneath, the silos will rise 150 ft. from the ground. The plant now has 21 silos with a total capacity of 200,000 bbl.

The company expects to be called upon by the state to furnish a large amount of cement for construction of the New York State Thruway next year. The additional silos will enable the state to select cement, made to its own specifications, and seal the bins until it is used.

German Cement Plant Exports More than Half of Output

Officials of the Teutonia Misburger Portland Cement works at Hanover, Germany, reported that 55 percent of all shipments from the plant were exported during the first half of 1952.

This firm has been able to rebuild its plant and to set up one of the German cement industry's most modern facilities. It will concentrate on streamlining production methods in order to maintain the high export trade. Although South American buyers dropped out of the field last year, Teutonia Misburger succeeded in finding alternative markets.

Lime Sales Show Slight Dip As Result of Steel Strike

Sales of dead-burned dolomite, showing the effects of the steel strike, were relatively low in July, 1952, but were slightly higher than in June. Building, chemical, and other industrial lime sales increased over the previous month, whereas agricultural lime continued to decrease. Sales of open-market lime totaled 472,565 short tons during July, a 4 percent increase over the 454,041 tons reported for June, according to reports of producers to the U. S. Bureau of Mines. The following table shows sales by types and major uses.

Lime Sold by Producers[1] in the United States, April-July, 1952, by Types and Major Uses, in Short Tons

	April 1952	May 1952	June 1952	July 1952
By types:				
Quicklime	499,689	513,606	300,534	328,448
Hydrated lime	186,680	162,851	153,507	144,117
Total lime[2]	686,369	676,457	454,041	472,565
By uses:				
Agricultural:				
Quicklime	8,437	7,276	3,214	3,009
Hydrated lime	34,897	22,743	15,977	9,742
Total	43,334	30,019	19,191	12,751
Building:				
Quicklime	17,807	18,683	18,701	19,229
Hydrated lime	85,260	79,764	81,072	82,523
Total	103,067	98,447	99,773	101,752
Chemical and other industrial:				
Quicklime	312,724	320,709	231,078	247,192
Hydrated lime	66,523	60,344	56,458	51,852
Total	379,247	381,053	287,536	299,044
Refractory (dead-burned dolomite)	160,721	166,938	47,541	59,018

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics.
[2]Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

$5,000,000 Contract Given Pioneer by Defense Dept. For 14 Portable Plants

Pioneer Engineering Works, Minneapolis, a subsidiary of Poor & Company, Chicago, has received a defense department contract for furnishing $5,000,000 worth of aggregates crushing, screening, and washing plants, including maintenance and repair parts.

The equipment, all to be portable, consists of the largest and heaviest units built for the armed forces. One complete plant, capable of producing 150 to 300 tons of processed material an hour, requires 11 railroad flat cars to ship.

Fourteen such plants are involved in the contract. Thirteen similar plants, on a previous contract, are in process of being built by the company, which since the Korean conflict started has received a total of $15,000,000 in defense production. Part of this total includes 60 plants of 50-tons-an-hour capacity, developed especially for the defense program and consisting of three units per plant.

Pioneering Works built all the large-size plants for the Army during World War II, at a rate of six complete plants per month. In order to handle the large volume of current production, the company has leased additional facilities in Minneapolis. It also utilizes subcontractors to the fullest possible extent.

The board of directors of Consolidated Cement Corporation declared a dividend of $1.05 a share on the Class A stock of the company, payable September 30, 1952, to stockholders of record September 15, 1952.

men over 45

More than six times as many men of your age will die of lung cancer this year as died in 1933. Our research scientists still don't know why.

They *do* know, however, that over half of those who will develop lung cancer *can* be saved . . . if they get proper treatment while the disease is still in the silent, symptomless stage. That's why we urge you to have a chest X-ray every six months no matter how well you may *feel*.

For more information call us or write to "Cancer", care of your local Post Office.

American Cancer Society

Allis-Chalmers Mfg. Co. Takes Over LaPlant-Choate

The LaPlant-Choate Manufacturing Company, Cedar Rapids, Iowa, has been taken over by Allis-Chalmers Manufacturing Company, Milwaukee, Wis. It will become the Cedar Rapids plant of Allis-Chalmers.

A. D. Dennis, president of LaPlant-Choate, is general manager of the plant. Wallace Gates is works manager, and H. W. Rockwell is chief engineer.

The scrapers and other products of the Cedar Rapids plant will be sold and serviced through Allis-Chalmers dealers.

Nesher Cement Co. Expansion To Give Israel Surplus Cement

Spokesmen for the Nesher Cement Company of Israel recently revealed that the firm has secured I £1,000,000 worth of securities by means of an issue sponsored jointly by the Solel Boneh Building Co-operative and the Palestine Trade and Investment Company. The funds will be used to expand the Nesher facilities, and it is expected that by 1953 the firm will be producing enough cement to fill national demands and export a substantial volume as well.

The securities will be issued in two types of debentures, one of which will offer the buyer an option to receive cement, free of control, at a fixed price in lieu of local currency. This is a device to protect investors against inflation.

Present output of the Nesher plant is 460,000 tons annually, which is 111,000 tons short of the needs of Israel. By next year the firm's new plant in Ramle, 15 miles southeast of Tel-Aviv, will be producing 160,000 tons. At Har Tuv, 10 miles west of Jerusalem, another plant, now under construction, is geared to turn out 250,000 tons annually.

California Portland Cement Company net income in the year ended April 30 was reported at $2,996,594, or $6.20 a share, as compared with $4,024,316 in the previous year.

• W. E. Hawkinson, A.-C. financial vice-president; A. D. Dennis, La Plant-Choate president; W. G. Scholl, A.-C. vice-president, Tractor Division; and John Ernst, vice-president, A.-C. Tractor Division.

Oklahoma Geological Survey Headed by Dr. William E. Ham

Dr. William E. Ham, geologist and assistant director of the Oklahoma Geological Survey for the last year, was promoted to the rank of associate director. He will serve as acting director, having been appointed by the University of Oklahoma Board of Regents.

Dr. Ham succeeds Robert H. Dott, who resigned as director last summer.

At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee (above) and face the life-saving facts about cancer, as presented in our new film "Man Alive!".

You and Ed will learn that cancer, like serious engine trouble, usually gives you a warning and can usually be cured *if treated early*.

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

American Mining Congress Holds 1952 Convention in Denver

THE 1952 metal and nonmetallic mining convention and exposition of the American Mining Congress was held in Denver, Colo., from September 22 through 25. The session, one of the largest ever held, was attended by several thousand mining men from all branches of the mining industry in the U.S., as well as by numerous foreign mining representatives.

A notable feature of the four-day meeting was the wide scope of the program, which included seven sessions devoted to general policies and problems of the mining industry, such as government control, taxation, and manpower, and six sessions dealing with specific operating problems, particularly with recent developments in both mining and processing. Another highlight of the 1952 congress was the large-scale exposition, which displayed the latest equipment and machinery used in all phases of mining. The meeting was climaxed by impressive field trips to several Colorado mining operations on September 26-27.

The general sessions consisted of a series of panels and informal discussion periods, in which several members of the U.S. Senate and House of Representatives joined with other national figures and leading mining men to consider current mining problems of national concern. General topics discussed included national mineral policies, especially those regarding defense minerals, tariffs, and stockpiling; public land policies; problems of small mining concerns; mine taxation; gold, silver, and monetary policy; manpower and labor relations; and atomic energy and uranium mining. A special panel dealt with the "Paley Report," recently issued by the President's Materials Policy Commission. The report is a 25-year forecast of the minerals and metals outlook, which makes recommendations on various controversial subjects. Participating in the panel discussions were the following senators: Arthur V. Watkins (Utah), Edwin C. Johnson (Colorado), Pat McCarran and George W. Malone (Nevada), Henry C. Dworshak (Idaho), and Francis Case (South Dakota).

The more technical operating sessions dealt with the latest improvements in methods and equipment for underground and open-pit mining and ore-processing. The numerous talks emphasized ways of reducing costs and increasing efficiency and safety through improved operating practices. Some talks stressed the need for increased mechanization in every phase of operation due to rising wage scales and manpower problems. Major topics discussed included progress in mechanization, open-pit mining, shaft-sinking and roof support, advances in milling practice, new metallurgical processes, and rock drilling.

Of particular interest to nonmetallic mineral producers was a paper entitled *Hydraulic Transportation of Solids* by I. S. Tillotson, mining superintendent, International Minerals and Chemical Corporation, Bartow, Fla. Mr. Tillotson outlined the method of conveying phosphate ore from the mine to the washing plant at the Bartow operation by means of hydraulic transportation through pipelines. Phosphate is mined by draglines and then dumped into wells from which it is sluiced by hydraulic monitors to a sump and then pumped to the mill. He stated that the Florida phosphate fields, which produce 75 percent of the U.S. phosphate production, utilize this hydraulic method to the greatest extent of any mining activity in the world.

Mr. Tillotson also stated that International Minerals, the largest producer of phosphate in Florida, has for many years been interested in the development of better methods for transporting phosphate ore. By integrating their experience with that of the manufacturer of the pumps, they developed the best equipment possible.

Ewald Kipp, Eimco Corporation, Salt Lake City, Utah, spoke on *The Responsibility of Manufacturer and Mine Operator*. He pointed out that a vital factor in the economics of mining involves a co-operative understanding between the mine operator and the machinery manufacturer. The growth of mechanization in mines has resulted in the machinery salesman becoming a sales engineer, who must meet on common ground with the mine operator. If each appreciates the other's problems and the two work as a team, the result will be higher efficiency and lowered mining costs.

The use of diesel locomotives at the underground limestone mine of the Great Western Sugar Company, Horse Creek, Wyo., was outlined by J. L. Fellows, engineer of Great Western's limestone department. The mine, which produces approximately 250,000 tons of limestone annually, utilizes three 5-ton diesel locomotives for haulage work, each equipped with an exhaust gas conditioner. The speaker said that there have never been any complaints of odors or gases underground.

According to Mr. Fellows, the first locomotive was put into service at the Great Western mine in 1942. During that year the average trip was approximately 2,700-ft. each way, and the train consisted of six 5-ton wooden quarry cars. Daily production amounted to 168 cars (about 700 tons). Now the company has switched almost entirely to 5-ton steel cars, using nine to a train. The average round trip has increased to about 7,800 feet, and daily production to 238 cars. The maximum production attained has been 306 cars in one 8-hr. shift, using two locomotives.

Another interesting paper was given by F. W. Hinrichs, geologist of the Fairchild Aerial Surveys, Inc., Los Angeles, Calif., on the subject of aerial exploration. He pointed out that in prospecting for regional mineral deposits, the use of airborne exploration methods should be carefully considered. He discussed several aerial methods, including the recently-developed airborne magnetometer, which is one of the most widely accepted and used methods today. He stated that more than one million square miles has been mapped by this method.

An integral part of the mining show was the four-day exposition held in Denver's city auditorium. It featured one of the greatest arrays of mining and milling machinery, equipment, and supplies ever assembled, in which more than 140 manufacturers took part. On display were machines in actual operation, working models of units and plants, and illustrations depicting equipment characteristics and performance.

On September 26-27 six separate field trips were made by bus or airplane to famous mining districts in Colorado, including Cripple Creek, Climax, Leadville, and Pueblo to see gold, silver, molybdenum, lead, zinc, and uranium mining operations.

One interesting trip was to the oil shale demonstration plant of the Bureau of Mines at Rifle, Colo., where the field group observed the underground mining of oil shale and the processing of the shale into oil products. The demonstration mine featured many new developments in mechanized operations, including the unique heading jumbo for drilling horizontal blast holes, a second rig for drilling vertical holes on benches, electric shovels, haulage trucks, a fork-lift mounted platform for charging blast holes, a telescopic mast mounted on a fork-lift truck for raising scalers 65 ft. above the mine floor, a movable compressor assembly, and an experimental rotary drilling rig. Advance top level headings 60 ft. wide and 39 ft. high are now being driven under the roof stone, and these are followed by 34-ft. benches, making the rooms 73 ft. high. Supporting the roof are pillars 60 ft. square and spaced 60 ft. apart, staggered in one direction. Both the automotive and mining equipment in use at Rifle are burning shale-oil products with good results.

Colo-Tex Announces Completion of New Plant For Processing Bentonite

Formerly located in La Junta, Colo., the Colo-Tex Mining & Engineering Company recently completed the construction of a modern plant to process bentonite at Las Animas, Colo.

The plant was erected alongside the main line of the Santa Fe Railroad, and the clay is dug at the pit deposit about 30 miles south of Las Animas in Bent County. The material is crushed to about 1½ in. maximum at the pit before it is trucked to the Las Animas plant. A Ford tractor equipped with a scoop-loader attachment loads the bentonite into a hopper inside the structure and handling from then on is by conveyor and air.

Grinding is done by a Ford (Myers-Sherman Company, Streator, Ill.) ham-

• The diesel engine which supplies power for plant operation.

mermill, followed by air-classification before the products are packed in 100-lb. paper bags. A G.M. diesel engine supplies the power for the plant.

End uses of the product are many and fineness of grind depends largely upon the use for which the bentonite is marketed. Locally the product is employed as a waterproof lining for irrigation ditches and reservoirs. Other important uses are for drilling oil wells, in molding sands, as a plasticizer, and as a bonding and emulsifying agent.

Operations at Las Animas are under the direction of B. W. Baker. Elmer Hancock, Pueblo, Colo., is president.

South African Phosphate Firm Sends Visitors to U. S. Plants

Visitors from South America and Africa were among the guests of the International Minerals and Chemical Corporation's Florida Phosphate Division at Bartow last summer.

First to inspect the plant was Brazil's Senator Apolonio Sales. Later three officials of the Phosphate Development Corporation, Ltd., Pretoria, Union of South Africa, arrived. These gentlemen were Gustav S. Preller, manager; B. M. Van Bergen, mining engineer; and D. J. du Plessis, chief chemist. According to Mr. Preller, prospecting work has been carried on by his firm for seven years. It is hoped that mining and processing will begin within two years.

• View inside the Colo-Tex plant shows the hammermill (right) at the head of the conveyor. The bag packer is at the left of the mill on the platform.

When full production has been attained it is expected that 700 tons of rock phosphate will be mined each day. After their stay at Bartow the visitors flew to Denver.

As indicated in the *P.C.A. Miner*, publication of the Potash Company of America, the firm's sales and sundry income increased (in the 12-month period ended June 30) from $15,443,759 in 1951 to $17,519,387 in 1952, an increase of more than 13 percent. However, due to rising costs and higher taxes, the net income increased only 6 percent—from $2,707,140 in 1951 to $2,877,155 this year.

• At the quarry of the Cedar Bluff Stone Company, Inc., Cedar Bluff, Ky., this unusual aggregate storage bin is a landmark. Originally designed for application in tunnel work, the lightweight metal liner plates serve equally well for this purpose. Bins and conveyor tunnels can be quickly erected with these plates, which also can be salvaged and re-used. The silo at Cedar Bluff is 30 ft. in diameter and 31½ ft. high. Armco Drainage & Metal Products, Inc., manufactures the plates.

Annual Digest on Labor Laws Enacted in 1951 Is Issued

Labor laws were enacted in all 44 states and three territories whose legislatures met in regular session in 1951, according to the *Annual Digest of State and Federal Labor Legislation* issued recently by the Labor Department's Bureau of Labor Standards as its Bulletin No. 152.

The most numerous changes were those made in workmen's compensation and unemployment insurance laws. Thirty-five jurisdictions increased benefits under workmen's compensation laws, and 23 extended coverage. Unemployment insurance benefits were increased in 21 states. Other enactments strengthened laws relating to temporary disability insurance, child labor and school attendance, discrimination in employment, and rule-making authority for safety standards. Major improvements were also made in wage-payment and wage-collection laws, minimum-wage provisions, and the regulation of private employment agencies.

Six federal acts were passed in the field of labor legislation. One affected deductions from seamen's wages; another, the recruiting of Mexican nationals; and a third, increased pensions for railroad workers. In addition, the Taft-Hartley Act, the Railway Labor Act, and the Selective Service Act were amended.

A limited number of free copies of this bulletin may be obtained from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C. Sales copies at 50 cents each are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. A discount of 25 percent is allowed on orders of 100 or more.

Directors of General Portland Cement Company declared a dividend of 50 cents a share on the company's common stock, payable September 30, 1952, to stockholders of record September 15, 1952.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE November, 1922, issue of PIT AND QUARRY announced the early publication of the PIT AND QUARRY HANDBOOK, the first and only publication of its kind for the nonmetallic minerals industries. Readers were asked to mail in their applications for a copy of this book so that enough could be printed to meet demands. For a new publication, the various chapters covered a wide range of subjects of interest to producers in this field. However, a comparison with the content of the present-day HANDBOOK shows the progress that has been made not only in the book itself but also in the technology of these industries. Many of the subjects in the present book could not have been covered 30 years ago because not enough information was then available.

Following are some of the subjects covered in the 1922 edition:

Standard Practice—A treatise outlining the standard methods of operation in each of the industries covered.

Statistics—Showing production, distribution, use, average price, etc., of pit-and-quarry products.

Maps—Showing distribution of materials and locations of plants.

Chronicle of Events — Record by months of the principal happenings of the past year in the pit-and-quarry industries.

Association Directory—Giving names, locations and officers of the various trade organizations in these industries.

Weight and Bulk of Materials—Tables showing weights per cubic yard, and yardage per ton; also angles of repose, and other constant factors.

Freight Rates and Traffic Regulations —Including loading, demurrage, switching charges, etc., in the several freight territories.

Highway Specifications—Digest of such specifications so far as they relate to mineral aggregates.

Insurance Rates—A digest of rates on fire and marine insurance.

Liability—Insurance rates and terms, rules in force in the principal producing states.

Explosives—Rules regarding transportation and storage.

Kinks—A "how to do it" department, giving methods which many producers have found effective.

Safety—Principal provisions of codes which have been recommended or adopted.

First Aid—Giving means of rendering quick assistance to wounded men.

Glossary of Terms—A full glossary of words whose chief application is in the pit-and-quarry field.

Catalogue—This section represented the leading manufacturers of machinery and equipment, and was so classified as to be readily accessible. An alphabetical index to this section was also provided.

List of Trade Names—Arranged alphabetically so that the manufacturers of any branded equipment could readily be traced.

In the plants in this issue gypsum predominated. There was a complete illustrated description of the operations of the American Gypsum Co. at Akron, N. Y. which produced 750 tons per day of crushed gypsum, principally for cement mills. The Empire Gypsum Co., also described in detail, operated in the same area a mine and plant which produced board, block, plaster, and raw gypsum.

The third plant described in detail was that of the Moline Consumers Co. near Ottawa, Ill., which produced washed and crushed gravel. Excavation was by means of a dipper dredge. After scalping, the material was carried on a belt conveyor mounted on a barge to stationary conveyors on shore. Screens and reduction crushers comprised the rest of the plant equipment.

Also in this issue was the fifth of a series of articles on *Institutional Management for Business. The Use of Big Blast Hole Drills* and *Electrical Hazards in Cement Plants* were also outlined.

A major news item predicted that cement production in 1922, if the last three months were in proportion to the first nine months, would considerably exceed the 100,023,245-bbl. record output of 1920. Much cement plant expansion activity was also reported.

Heebner Quarries Supplying Riprap for Army Engineers

Granville Heebner, proprietor of the Heebner Quarries, Nebraska City, Nebr., reports that he is opening a new quarry near Fort Orook, Nebr. A Link-Belt LS-51 is doing an excellent job of digging riprap for the U. S. Army Engineers working on Missouri River Development projects. The material is hauled about 20 miles.

Mr. Heebner produces more than 2,000 tons of material per day in his operations in Sarpy, Cass, Nemaha, and Richardson counties in Nebraska.

Volcanic Pozzolan Plant Opens El Paso Operations

A plant for the production of a pozzolanic material has been completed and placed in operation by the Halliburton Oil Well Cementing Company in El Paso, Texas.

The El Paso reduction plant receives raw material from a volcanic deposit near Malpais, N. M., where the material is reclaimed by bulldozer. It is crushed and sized at the plant and shipped to various points where it is being used in oil well cementing. The material is being sold under the name of "Pozmix Cement."

The new plant employs 16 persons and is being managed by Henry Mussman, plant superintendent.

• Freezing of sand in the discharge pipes dewatering towers at the George F. Pettinos Company, Manumuskin, N. J., is prevented by the use of lead-covered heating cable. The cable was wrapped around the bottom of the pipes and covered with a sheet metal form. When the temperature falls below freezing, the current is turned on and supplies enough heat to keep the sand moving. Sixty-foot lengths of General Electric heating cable were used in the installation.

Venezuelan Sulphur Company Exploring Extensive Deposits

According to a report from the Venezuelan Mining Association, the Venezuelan Sulphur Company is exploring sulphur deposits at El Pilar, near Puerto la Cruz.

Samples of the ore have been sent to the United States and to Europe for anaylsis, and a small crew is being maintained at the mine during preliminary investigations. The deposits are said to be extensive.

Sulphur from Kashmir Beds Investigated in New Delhi

Within 40 miles of the border of Communist-held Tibet in the mountains of Kashmir Indian mining engineers have located a deposit of sulphur estimated to contain 400,000 tons, the largest concentration of the mineral on record in the peninsula. Although samples of the sulphur reportedly have been taken to New Delhi for study, official sources refused to comment upon the find.

The deposits are in mountainous country with a terrain so wild that geologists say that it is not certain when adequate transport facilities could be developed.

A gravel washing and screening plant has been installed by El Monte Ready-Mix, Inc., Elma, Wash. The plant, which is currently producing sand and gravel for the company's ready-mixed concrete activities, consists of a conveyor to a series of four washing screens where the pit-run material is washed and sized for storage in bins below.

Boom Town in the Adirondacks

By ALFRED H. TROST

• The quarry at Willsboro, N. Y., where wollastonite was identified in 1937, more than a century after the material had been discovered in the area by Dr. William Meade.

another P.Q. first exclusive

TO the sleepy little village of Willsboro, N. Y., nestled in a crook of the Lower Bouquet River, where the Adirondacks jut forth to promise of new life—all because of wollastonite, a nonmetallic mineral which is about to make its debut in industry. Trodden on for years, discovered, forgotten, rediscovered, this infant of the nonmetallic minerals bids fair to outdo many of its predecessors in its usefulness to man.

Dr. William Meade, in 1810, was the first to note the occurrence of wollastonite near Willsboro. Lardner Vanuxem, in 1821, reported the presence of the mineral in Essex County. Then, for over a century, the deposit lay undisturbed, its presence forgotten or ignored.

About 1920, John B. Burnham, nationally known for his conservation and forestry accomplishments, became interested in the development of a garnet deposit near Willsboro. He and his son, Koert Burnham, mined and shipped massive garnet from the area. In 1937, two years before John Burnham's death, mining operations exposed a "new" mineral. What was it, and what was it good for?

The identification was not difficult, but there was no ready-made list of uses for this white, crystalline rock that was spotted here and there with traces of garnet. Koert Burnham decided to find out all he could about wollastonite and what could be done with it. The process was long and painstaking; and, even with the untiring assistance and interest of Rose Burnham, Koert's sister, at first not altogether encouraging. But gradually out of the mass of accumulated information there arose certain definite indications that this was a material which, with proper handling, could be put to many diversified and profitable uses.

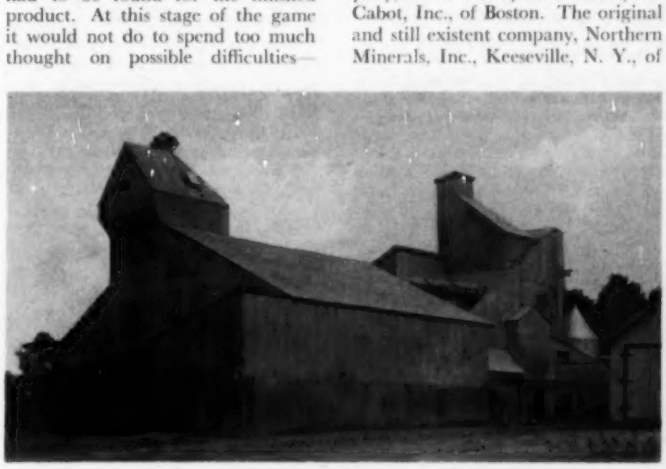
This was only the start. The project was still only a dream, bedded down in a solid mass of rock that formed part of a hillside about two and a half miles west of Willsboro. The mineral would have to be quarried out of the hillside, trucked out to some convenient location where it could be crushed, refined, and ground in a mill whose site was not even determined. Then a market had to be found for the finished product. At this stage of the game it would not do to spend too much thought on possible difficulties—those that might be encountered, for example, in the refining and custom grinding of a product to meet the exacting specifications of a particular purchaser. The immediate problem was to get started; the rest could be worked out along the way.

By 1938 mining operations were under way. In 1939 the Fox Hill quarry was opened, and during the next five years about 100 tons were taken out annually. This production, although admittedly small, was sufficient for experimental purposes and the then limited demands of industry. The first pilot plant was located in Essex, some five miles from Willsboro.

In 1949 a new pilot plant, so designed that it could be expanded for commercial production, was built in Willsboro. This plant, now expanded and capable of producing about 65 tons of finished wollastonite per day, is known as plant Number One.

Plant Number Two, located about midway between the quarry and plant Number One, is expected to be completed early in 1953. Production plans call for a daily output of two hundred tons, but up to three or four times this amount could be produced with only a small additional capital outlay.

Plant Number Two and the consequent commercial development of wollastonite are being made possible through the investment of $2,000,000 by Cabot Carbon Company, a subsidiary of Godfrey L. Cabot, Inc., of Boston. The original and still existent company, Northern Minerals, Inc., Keeseville, N. Y., of



• Plant No. 1 at Willsboro, which produces approximately 65 tons of wollastonite per day.

which Mr. Burnham is president, leased production rights some years ago to the Willsboro Mining Company. The latter concern maintained limited commercial production for several years until the recent sale of their rights, late in 1951, to Cabot Carbon Company. The future of wollastonite at Willsboro now rests with this firm, and from all indications this trust has not been misplaced.

Wollastonite is not an uncommon mineral, but its occurrence in quantities sufficient to merit commercial exploitation has been rare. One deposit in Bucks County, Pennsylvania, was entirely used up in the production of portland cement. Starting in 1933, a second deposit in Kern County, Calif., was worked intermittently and on a small scale to furnish material for mineral wool.

To date the deposit at Willsboro is the largest yet discovered. Plans call for extensive, long-term development of the mineral. With estimated reserves of 15,000,000 tons, much of this outcropping in such a manner as to make quarrying feasible, and the possibility of even more tonnage available, an abundance of ore is assured.

The plant sites are ideally located, the farther 2½ miles from the quarry and the nearer about 1¼ miles. Truck and rail facilities are excellent, and there is the possibility of water transportation by means of Lake Champlain and the Barge Canal, if needed. The Bouquet River will furnish an adequate supply of water for milling purposes; high voltage power lines cross the plant site; and the existing economic situation within the area insures a plentiful labor supply.

As found in nature, wollastonite assumes a weathered, dirty-brown surface covering which protects the material beneath from further change. Unless this surface covering is chipped off, the mineral has an unobtrusive appearance, blending with most natural surroundings, and might easily escape detection even by a careful observer. During either the spring of the year or a dry fall after a recent rain, it may be located by carefully noting the difference in color of the moss growing upon the rocks of the area in question. Because wollastonite is a soil builder its effect on the growth of the moss is beneficial, and the difference in color tone serves as an indicator.

• Closeup of quarry, showing outcroppings typical of those occuring along a 6-mile belt.

Once the outer, weathered surface is chipped off, wollastonite appears as one of the whitest of all natural materials. Coarsely crystalline, it is streaked and speckled at random with garnet and diopside. The purer wollastonite grades towards a brilliant white; the presence of impurities, however, brings about a tendency towards a gray or, more rarely, a yellow color. The hardness of wollastonite ranges from 4 to 5. Chemically it is classed as a calcium metasilicate, formula $CaSiO_3$.

The peculiar crystalline structure of wollastonite is basically responsible for many of its industrial uses. Fragments of the substance break off in the shape of needles or blades. This acicular property may be maintained, if desired, in the grinding process, giving a final product that has a fibre length of as much as 12 to 15 times its diameter. This property is not common to many industrial minerals. The long fibre length of wollastonite is especially desirable for certain uses in the mineral filler industries. Refined and ground wollastonite is an attractive white, somewhat fluffy material that has a bulk density of from 35 to 57 lb. per cu. ft.

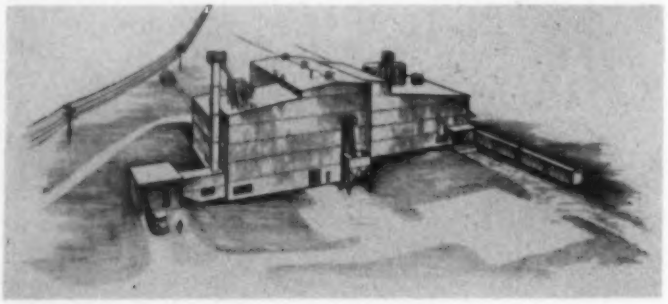
The wollastonite deposit at Willsboro is located about 2½ miles west of the village. The strike is roughly north 70 degrees west. Two beds have been exposed in the southern end of a quarter-mile strip that extends for a length of 6 miles. Diamond drilling has proven several million tons; possible tonnage may reach a much greater figure. The main bed varies from 30 to 70 ft. in depth and dips 30 degrees northeast. Yield is about 1,000 tons per ft. along the bed.

Layers of garnet-bearing rock up to 8 in. thick limit the thickness of individual wollastonite layers to about 5 ft. A thin layer of green diopside often appears between the garnet and wollastonite layers. Outcroppings occur at several localities along the 6-mile belt, but mining operations have been limited to the southern part. Quarry operations will be possible for many years before underground mining becomes necessary.

The first step in the milling consists of breaking down the ore to a size capable of being handled by a jaw crusher. Then it is further reduced by roll crushers until the garnet and diopside inclusions are free. Garnet and diopside are both moderately magnetic, while wollastonite is non-magnetic. The use of high-intensity magnetic separators makes it possible to separate the wollastonite from the garnet and diopside. Another method of separation depends on the use of air tables.

Once the wollastonite has been separated from impurities, it is passed on to the grinders. Both wet

• Sketch of Mill No. 2 at Willsboro, to be located half way between Plant No. 1 and the quarry, will be completed early in 1953.



and dry grinding methods are available at plant Number One. The product is custom ground to meet the specific needs of the purchaser. For many uses grinding that preserves the natural fibre length of the mineral is desirable; in some cases, specifications call for shorter fibre lengths. An automatic bagger prepares typical lots for shipment.

The first important use developed for wollastonite was in the preparation of coated welding rods. Later the material was used as a flux in an electric arc welding process initiated by General Electric.

A more intensified search for possible uses, employing the help of the New York State College of Ceramics at Alfred, New York, and Horizons Incorporated of Cleveland, Ohio, resulted in the discovery of a host of possible applications. The fields of paint and ceramics have been investigated with encouraging results, and numerous other diversified uses have come to light.

Wollastonite has proved to be desirable as a white pigment for substances such as paint, rubber, and paper. While it is possible to grind wollastonite to the fine size needed for such uses, it may be found more economical to take advantage of the chemical properties of the mineral to reduce a relatively coarse grind to the size required. Tests have shown that wollastonite paints maintain clearer tints and exhibit desirable weathering qualities. Ultimate deterioration is by chalking rather than peeling or checking, thus leaving an ideal surface for repainting.

Carrying on the search for possible uses of wollastonite, Horizons Incorporated worked out a method for producing a cement composition based on wollastonite. This material is capable of being removed from a flexible mold within a few minutes after casting, and, after firing, a product is obtained which has sufficient inherent strength to permit saving, drilling, or nailing without damage. Commercial applications of this process extend into the fields of artware, fireproof floor tile, wallboard, sidings, and veneer.

Wollastonite may be mixed with asbestos as a secondary filler in the manufacture of floor tile. Large-scale production of wollastonite will make this partial substitution attractive from an economic standpoint.

In the field of ceramics wollastonite has been shown not only to be a match in quality for existing high-grade tiles but to surpass them in reduced production costs. Tiles made of wollastonite can be produced by a rapid one-fire process, saving fuel costs and permitting a higher output per kiln.

Reduced manufacturing costs are also possible in the use of wollastonite in glazes and enamels. Wollastonite acts as a natural frit, thus eliminating the need for pre-fritting.

Another application in the field of ceramics is being invesigated by the United States Signal Corps. Wollastonie, used as an insulator in various types of electrical equipment, exhibits properties superior to any electrical low-loss ceramic bodies now available on the market.

The use of fiber-ground wollastonite as an insulating material for kilns and furnaces has been suggested. The mineral also has been found valuable in agriculture, serving as a soil conditioner and as a partial substitute for calcium phosphate. One study at the Tennessee Agricultural Experiment Station indicated that wollastonite was up to three times as effective as agricultural limestone. Weathered and off-grade ore could be used to meet these demands.

As wollastonite comes from the quarry at Willsboro, it contains about 15 percent andradite garnet. This mineral is recovered in the separation process and is sold as a by-product to the abrasive industry. Garnet from the Willsboro plant provides an economical source of intermediate grade abrasive. Current research points out the possibility that this garnet, especially in the finer grinds, may find expanded uses in several fields.

Wollastonite has already proved to be a valuable nonmetallic mineral. The investment of $2,000,000 by Cabot Carbon Company is in itself a tacit recognition of the fact; and yet the men who have been working with the mineral feel that the surface has hardly been scratched. Wollastonite has a future.

Koert Burnham, who has been working with wollastonite since 1937, is interested in the further development of the mineral. Now that Cabot Carbon has taken over the production of Willsboro wollastonite, Mr. Burnham and his research associates of Horizons Incorporated plan to pool their talents to commercialize any mineral deposits which seem to possess worth-while industrial applications.

"We are merely standing on the threshold," Mr. Burnham has stated, speaking of wollastonite and other of the less well known nonmetallics.

Boom town of the Adirondacks? Yes, but there is permanence here, too.

Universal Atlas Builds Roads To Last at Buffington Plant

In August a new access road was built by the Universal Atlas Cement Company for its Buffington, Ind., plant. Use of Duraplastic (air-entraining cement) in the concrete is said to give pavement resistance to scaling, caused by freezing and thawing and by salts used to melt ice.

The new road, necessitated by a heavier traffic load, was laid down over a narrower concrete pavement put down in the coldest winter months of 1917 by Universal Atlas. At that time the company wished to demonstrate the feasibility of using concrete in any weather. The old road lasted 34 years—until the need for a wider, heavier thoroughfare provided an opportunity to stage another demonstration, this time with Duraplastic.

Quarrying Methods in U.S.A. Described by Dutch Author

Quarrying Stone for Construction Purposes, a new textbook by H. Streefkerk, although published in the Netherlands, is based upon methods now practiced in commercial quarries of the United States.

Addressed to civil engineers, the volume serves an an aid in planning quarry operations and construction projects and contains information helpful in selecting equipment for such work. Various American-made units are pictured and described; and the text is amply supplemented with diagrams, photographs, sketches, and tables.

Included are discussions of large- and small-diameter drills, blasting methods, production of stone for aggregate, coyote tunneling, and related subjects. Special stress is laid upon factors controlling costs.

Sole distributor for the United States, Van Riemsdyck Book Service, Inc., 207-211 E. 47th Street, New York 16, N.Y. Price, $5 per copy; 159 pages.

New Work on Soluble Silicates Published in Two Volumes

A recent technical publication is Volume I of *Soluble Silicates* by James G. Vail, written to replace *Soluble Silicates in Industry* (American Chemical Society Monograph No. 46), now out of print. The new book is divided into two volumes "to provide a rapid reference source for the working technician".

Volume I (Chemistry) is devoted to the theoretical aspects of the subject and covers past and present manufacturing processes, properties of homogeneous and heterogeneous system of glasses, the formation of metallic silicates, and other related material. It is designated A.C.S. Monograph No. 116.

Published by the Reinhold Publishing Corporation, 330 W. 42nd Street, New York 36, N. Y.; 357 pages. Price, $9 per copy.

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

BOILED down to its simplest fundamentals, the heart of the Republican campaign appeared to be its well-publicized slogan, "It's time for a change," while the heart of the Democratic campaign was, "Why change? You never had it so good."

While there were a multitude of subsidiary issues such as corruption and Communists in government, the political analysts seem to agree that by election time most voters were persuaded principally by their concern for their economic well-being. Even the critical foreign policy questions took second place.

Accordingly, in analyzing this election, it is not inappropriate to ask, "How good are things for the American people?" Until a few years ago, it was almost impossible to find anything approaching an accurate answer to this question. However, in recent years the University of Michigan's Survey Research Center has been commissioned by the Federal Reserve Board to make an Annual Survey of Consumer Finances. Essentially, once a year they "take the economic temperature" of the American people and give us a report as to their well-being. Their most recent report, covering the year 1951, has just been published.

They make their study in terms of the "spending unit" which is "all the persons living in the same dwelling and belonging to the same family who pool their incomes to meet their major expenses". The average annual incomes of all spending units since 1946, when the surveys were begun, moved as follows:

	Median Annual Income
1946	$2,300
1947	2,530
1948	2,840
1949	2,700
1950	3,000
1951	3,200

The median is generally regarded as the best measure of average incomes. The median is determined by listing the incomes of each spending unit in order, from lowest to highest, and selecting the middle one. This shows a 39 percent increase since 1946, the end of World War II, and a 13 percent increase since 1948, the last Presidential election. These statistical facts cannot be gainsaid—nor should they be used to jump to broad general conclusions without further analysis.

For example, a look at the situation for different occupational groups show some significant differences.

Of special interest is the fact that the average annual incomes of the professional, semi-professional, managerial, and self-employed groups showed the worst record. Perhaps this is why the Democratic party was least sure of their votes. They seemed to have the best reason to believe that "it's time for a change".

On the other hand, the best record of increases is found among the skilled and semi-skilled workers. These are, in great part, the unionized workers. The record, no doubt, explains why the CIO and the AFL officially endorsed the party in power. The clerical and sales groups are not far behind. Thus, it is these groups who generally agreed, "Why change? We never had it so good." And they were the stronghold of the Democrats.

The low-paid unskilled and service workers and the farmers enjoyed substantial income boosts but not since the last Presidential election. They were in a quandary.

Let us take the spending units headed by skilled and semi-skilled workers, whose annual incomes rose more rapidly than any other, and inquire "How good do they have it?" The following table indicates the answer. It compares their average annual incomes with the "cost in dollars for a city worker's family of four persons to maintain an adequate level of living according to prevailing United States standards of the needs for health, efficiency, and nurture of children and participation in community activities. It is neither a 'subsistence' nor a 'luxury' budget. It provides a modest and adequate American standard of living based upon the kinds and quantities of goods and services that workers actually select."

Year	Median Annual Income of Spending Units Headed by Skilled and Semi-skilled Workers	Estimated Average Budget for City Workers Family*
1946	$2,700	$2,800
1947	3,000	3,300
1948	3,300	3,400
1949	3,200	3,500
1950	3,600	3,700
1951	3,800	4,200

*Estimated on basis of Bureau of Labor Statistic data for 34 cities and Consumers Price Index.

Occupation of Head of Spending Unit	Median Annual Income 1946	1947	1948	1949	1950	1951	Percent Increase 1951 Over 1946	1951 Over 1948
All spending units	$2,300	$2,530	$2,480	$2,700	$3,000	$3,200	39	13
Professional and semi-prof	4,000	4,000	4,000	4,000	4,500	4,500	13	13
Managerial and self-employed	3,700	4,500	4,500	4,500	4,500	4,780	29	6
Clerical and sales	2,600	2,900	3,000	2,800	3,200	3,460	31	14
Skilled and semi-skilled	2,700	3,000	3,300	3,200	3,600	3,800	41	15
Unskilled & service	1,600	1,750	2,100	2,100	2,100	2,100	31	0
Farm operator	1,300	1,500	1,800	1,500	1,900	1,880	45	4

From this table it may be seen that while the average income of spending units headed by skilled and semi-skilled workers increased by 41 percent since 1946 and 15 percent since 1948, the cost of maintaining a worker's family increased over the same period by 50 percent and 24 percent respectively. Put another way: in 1947 the average income and the required budget were not very far apart, no more than $100. In 1951, the average income appeared to fall below the budget by as much as $400. From this, it appears that the state of well-being relied on so heavily by the politicians may well have been illusory.

Government to Establish New Mica Purchase Depot

Plans are being completed for the establishment of a purchase depot for high-grade mica at Franklin, N. H., it was announced by Jess Larson, administrator of General Services and of the Defense Materials Procurement Agency. The new station, similar to ones now being set up at Spruce Pine, N. C., and Custer, S. D., will be operated by the Emergency Procurement Service of GSA for DMPA. Incentive prices will be paid to encourage the discovery, development and production of domestic mica.

The regulation setting up the depot at Franklin, which will set forth the specifications for mica acceptable to the government and the price schedule, will be available from the GSA Regional Office, 620 Post Office and Court House, Boston 9, Mass.

HUDSON ENLARGES GUARANTEE ON MULTIWALL SACKS: NOW COVERS DAMAGE ON PACKER

Will replace without cost any Hudson Multiwall Sack broken on packing or closing machines

NEW YORK CITY. The Hudson Pulp & Paper Corp. has announced the terms of an unusual new guarantee to purchasers of Multiwall Sacks. In the first such guarantee in Multiwall Sack history, the company binds itself to replace any Hudson Multiwall Sack which bursts, tears, splits, or otherwise fails in the course of packing or closing. Hudson emphasizes that this new guarantee is in addition to their usual warranties of quality and workmanship implicit in every contract.

A typical scene showing Multiwall Sacks being filled and closed. Now, for the first time, a Multiwall Sack manufacturer is guaranteeing to replace any sacks broken during such operations.

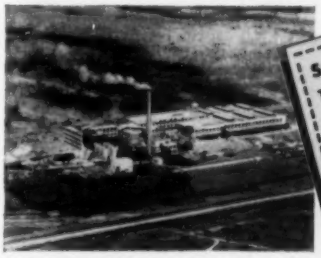
Multiwall Sack Users urged to investigate this offer

The new Hudson guarantee plan went into effect with all sacks purchased on or after Sept. 15, 1952. Multiwall Sack buyers who have learned of this new plan have hailed it as one of the most important developments in years.

Full information regarding the scope and benefits of the guarantee is being sent, without obligation, to all Multiwall Sack buyers who request it.

Integrated Hudson mill assures delivery

Hudson Multiwall Sack contracts are backed up by a fully integrated new mill at Palatka, Florida. Because every step of manufacture is under one control, Hudson is certain all sacks are made to your exact specifications, and are shipped when they are promised!



Though Hudson's Palatka mill is new, Hudson has 42 years of paper making experience.

T. H. Mittendorf (right), Hudson Vice President in Charge of Sales, and J. B. Mendelsohn, Multiwall Sack Sales Manager, look over the first printed copy of the company's unusual guarantee on Multiwall Sacks.

World's most fully guaranteed Multiwall Sack

Hudson has such faith in the quality of its Multiwall Sacks that it gives the world's fullest guarantee on their performance. While other companies warrant their sacks only against abnormal breakage, Hudson guarantees that *all* its sacks must successfully pass *all* filling and closing operations, or be replaced without further cost.

Urge Multiwall Sack users to write for facts

The Hudson Pulp & Paper Corp. invites all users of Multiwall Sacks to learn how they can s... by using guarant... Multiwall Sacks... guarantee, ...acts ...vs ...n ...r ...by ...be worth

Send for full details:

Tell me, without obligation, about the many advantages of your new Multiwall guarantee.

NAME_____

COMPANY_____

STREET_____ ZONE____ STATE____

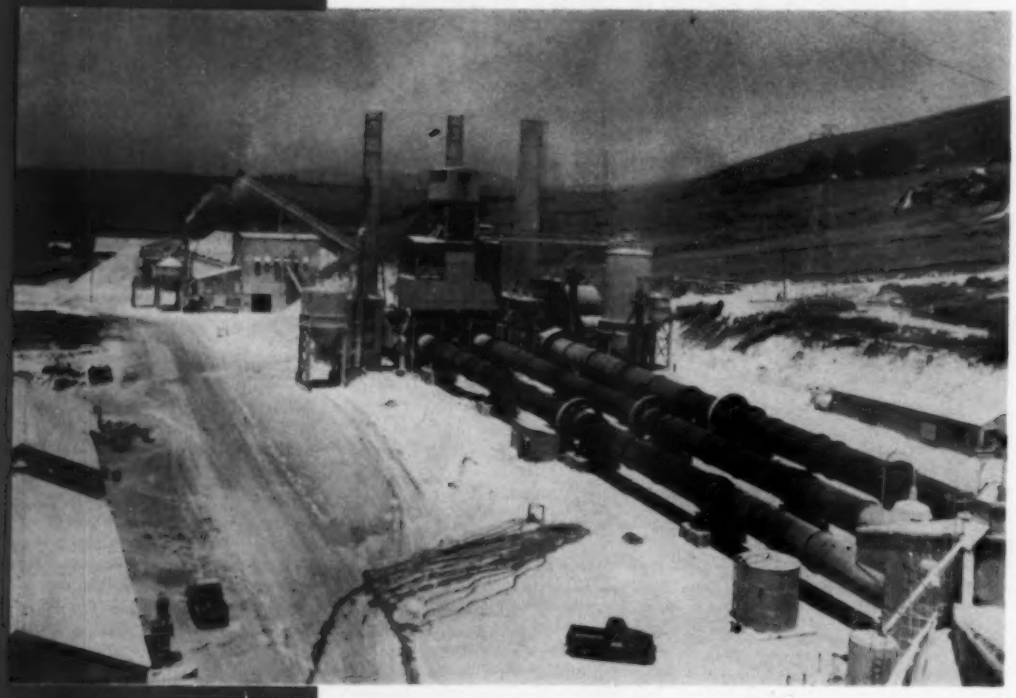
CITY_____

Hudson Pulp & Paper Corp.
Dept. 101, 505 Park Ave., New York 22, N.Y.

HEAVY-MEDIA SEPARATION PLANT

Solves Problem of Up-Grading Dolomite at KAISER OPERATION

By HARRY F. UTLEY



another ON THE SPOT report

THE Natividad, Calif., dolomite and the Moss Landing, Calif, magnesia plants of the Chemical Division of Kaiser Aluminum & Chemical Corp., erected a decade ago, were born of the need for raw materials for metallic magnesium being produced by the company for the war effort at Permanente and Manteca, Calif. The Moss Landing plant supplied seawater magnesia for the carbo-thermic process used at Permanente, while the Natividad quarry and plant produced calcined dolomite for Manteca, which used the silico-thermic process.

Following World War II, the company began an effective utilization of its production capacity in peacetime channels and has been expanding its facilities ever since. In 1951 a third rotary kiln was installed at Natividad, boosting capacity nearly 50 percent; a new face on the 700-ft. level was opened in the dolomite quarry to provide added raw material; and in March of 1952 a heavy-media separation system to produce a higher quality of dolomite was placed in operation.

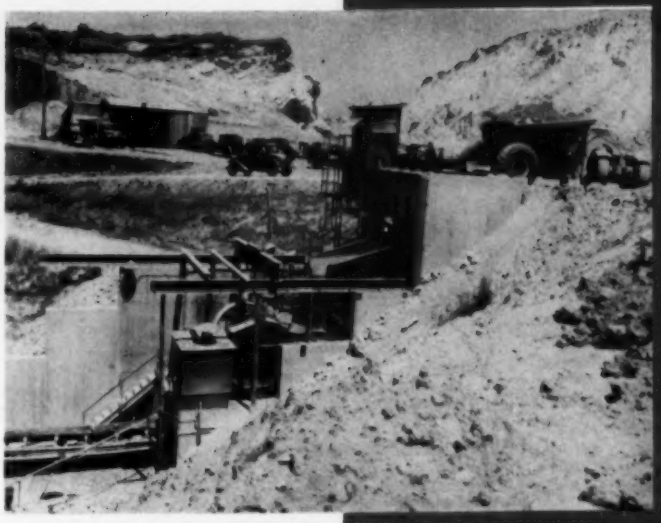
Over a ten-year period, the Natividad quarry in the Gabilan Hills east of Salinas, Calif., had been capable

of delivering to the kilns a grade of dolomite that needed no treatment other than crushing, washing, and screening to remove the minus 3/16-in., which was wasted. Ten years of large-scale mining was, however, beginning to accomplish the inevitable end result of depletion, and early in 1951 it was determined by Kaiser engineers that some method of up-grading was necessary to maintain the high quality of the end products.

Dolomite grade requirements were pegged at less than 1.25 percent SiO_2, and less than 1 percent R_2O_3 (miscellaneous contamination). Quartz, opalite, serpentine, and granite occur as stringers or masses in the quarry, and selective quarrying to exclude the contaminated zones was only partially satisfactory. So preliminary studies were carried out by the company's experts to determine a low-cost means of beneficiation. Heavy-media separation seemed to indicate a solution to the problem, and the Western Machinery Company of San Francisco was called in to conduct tests to determine whether the ore was amenable to treatment by the sink-float method or other processes. Various samples were taken from the contaminated zones of the quarry and from waste piles. Extensive testing proved that heavy-media separation offered the simplest, most economical, and most flexible process.

Kiln capacity indicated that the beneficiation plant must be capable of delivering 190 t.p.h. of concentrate (the "sink" fraction) from a feed from the quarry of approximately 200 to 225 t.p.h. Tests established that a sink product assaying 0.78 percent SiO_2 and 0.69 percent R_2O_3 could be produced with minus 4-in. plus 3/16-in. run-of-quarry grade material, at a separating gravity of 2.70. Further requirements were that the beneficiation unit must be flexible enough to operate at top efficiency on varying amounts of feed, so that all or a part of the quarry product could by-pass heavy-media separation plant and be sent direct to the kilns in the event the dolomite was sufficiently high grade and acceptable for burning without beneficiation.

In October, 1951, the Kaiser Company ordered a No. 5M Wemco Mo-



Quarry wagon dumping a load into the hopper, from which a grizzly feeder will operate through the 16-in by 48-in. jaw primary crusher

A general view of the new heavy-media separation plant. The preliminary scrubbing and scalping department is in the distance at the lower end of the inclined feed conveyor.

One of the 17-ton-capacity haulage units being loaded in the quarry by the 4-cu. yd. electric shovel.

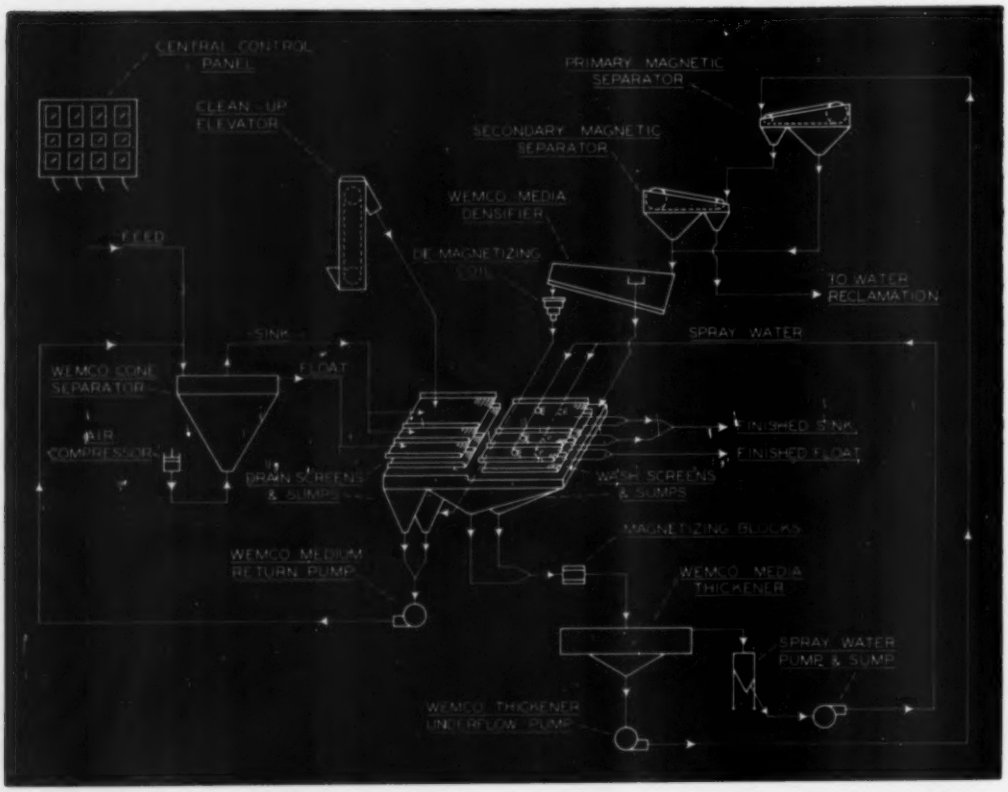
Left: Dolomite concentrate is weighed automatically by this conveyor scale before going to the kilns.

Right: Looking from the primary crusher hopper in the Gabilan Hills toward the screening tower. The waste dump is at the far left; the conveyor to the plant at the right.

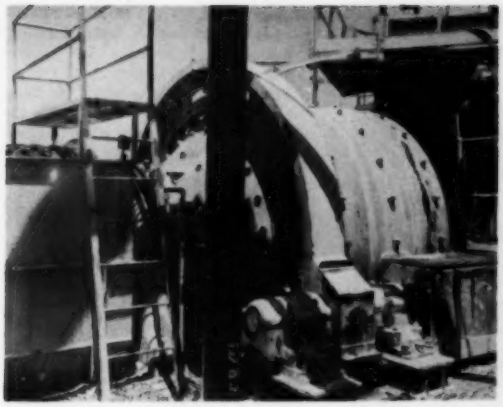
bil-Mill from Western Machinery Co. This is a prefabricated H.M.S. plant incorporating modifications to suit the specific requirements of the Natividad application. The plant was shipped on January 21, 1952, speedily erected by company forces, and put in operation on March 18, 1952.

Before attempting to describe the heavy-media separation functions, a brief resume of the quarrying and primary preparation of the dolomite is in order. Drilling is contracted and the holes loaded with Hercules 40- and 60-percent dynamite. Detonation is accomplished with Primacord and millisecond-delay caps. Blasts are set off at 2- to 4-week intervals to bring down from 100,000 to 200,000 tons of stone. A Bucyrus-Erie 4-cu. yd. electric shovel on crawlers does the bulk of the loading, and Caterpillar DW10 diesel tractors pull Athey bottom-dump trailers which carry 17-ton loads to the hopper of the primary crusher near the quarry. Feed from the 50-ton live-storage hopper to the Traylor Bulldog 36- to 48-in. crusher is by way of Traylor-Sheridan 18-ft. grizzly feeder. The grizzly by-passes minus 6-in. material, oversize being reduced to like size by the crusher. A Ty-Rock 5- by 12-ft. double-deck screen in the following circuit takes out the fines, usually minus ⅜-in. but up to 1-in. in wet weather to obviate blinding. The fines are wasted *via* a belt conveyor and radial

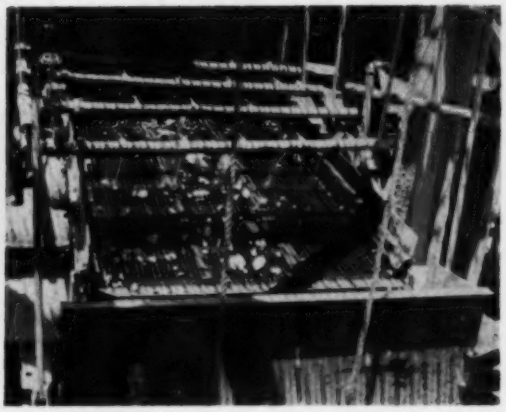
(*Continued on page* 98)



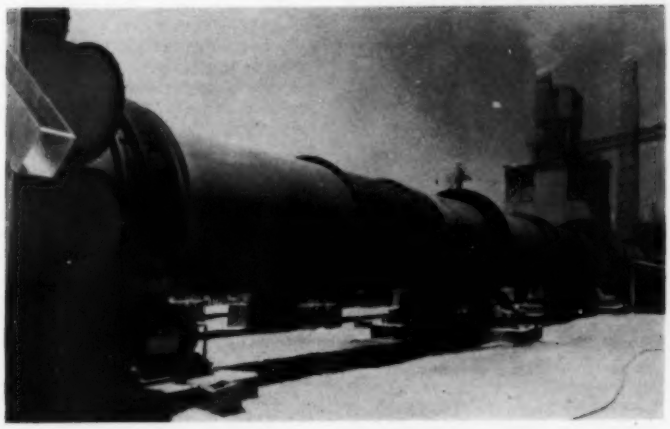
Flowsheet of heavy-media separation circuit.



Conical scrubber and trommel at the left clean and scalp the dolomite before concentration can take place.



Fines are removed and wasted and the dolomite is spray-washed over this 5- by 10-ft. screen preliminary to beneficiation in the high-media separation plant.



The No. 3 kiln is the newest addition to the Natividad calcining plant. This view shows the 30-ft. section (with coolers at the left) added at the firing end, to give the kiln a total length of 280 ft.

This longitudinally-divided screen handles both the desired sink (left) and waste float from the separator, while sprays wash off the remaining medium clinging to the particles.

The 18-ft. cone separator which is filled with the ferrosilicon medium. The heaviest product, the good dolomite, sinks and is raised to the launder by the air-lift at the center; the float overflows to another launder at the lower right of the weir.

One of the magnet separators in the high-media separation plant which aids in concentrating the magnetized medium before re-use in the cone separator.

The Dollar Wisdom of Keeping Compressed Air Lines Tight

COMPRESSED air, as emphasized by its increased use, has proven itself among the foremost production power media. Maximum benefits are being obtained by those who keep a close vigilance over their air systems. Conversely, where reasonable maintenance is not conducted, a loss in production and dollars is experienced.

One of the greatest production robbers is low pressure. It has been found that if the pressure at a pneumatic tool falls from 90 to 70 p.s.i.g., production output of that tool may drop as much as 35 percent. Somewhat more specific is the case of the air motors which are used extensively to power air tools and devices. Air motors offer more horsepower per unit weight than other comparable power sources. Because compressed air systems in most plants utilize pressures between 90 and 110 p.s.i.g., air motors are designed to operate within those working pressures. An air motor built to operate at 90 p.s.i.g., however, will lose 25 percent of its capacity if line losses in delivering air drop the pressure to 70 p.s.i.g.

First inclination when air pressures drop may be to place the blame on insufficient compressor capacity. A check of the air distribution system, first, may save the cost of new compressor equipment.

One of the principal causes of low-air pressure are leaks in the distribution system.

Checking the air distribution system for leaks is a relatively simple matter. Results have proved that the most likely locations of small leaks are around valve stems, hose connections, unions, drains, home-made blow guns, and lines leading to inoperative tools. Of course, the entire system should be checked, and particular attention should be given to the points mentioned above and to lines which are subjected to unusually rugged treatment. Inspections should be made monthly.

Plant maintenance departments have come up with many simple and unique ways of checking leaks. Most frequently used are the lighted candle or the solution of soapy water which is brushed around suspected areas. One manufacturer puts essence of peppermint into the air system. Detection of the slightest leak is by odor. Still another method, rather ingenious, is the use of what heretofore may have been considered nothing more than a youngsters' toy. A small siren-like whistle, activated by air flow, is passed over the lines, and a siren noise indicates a leak. Regardless of what method is adopted, when leaks are found, patch them immediately.

● A quick check with a hypodermic needle-gauge device indicates the pressure received by the tool. (Hole made by the needle is self-closing.) A low pressure means lost production. Frequently the cause is a leaky distribution system, which should be inspected and made tight.

Some of the leaks may be very small, appearing trivial in themselves. But such leaks may be numerous and have a high cumulative effect. Actually, these leaks spell a very definite dollar loss, as shown in the accompanying table. This dollars-and-cents wastage more than justifies scheduled maintenance of air distribution systems.

Cost of Air Line Leaks

Size of Opening Inches	Air Lost (Cu. Ft. per Month at 100 p.s.i.g. Based on Nozzle Coefficient of 0.65)	Cost of Air Lost $0.07 per 1000 Cu. Ft.
1/8	6,671,890	$467.03
1/4	2,920,840	204.46
1/8	740,210	51.81
1/16	182,272	12.75
1/32	45,508	3.19

Couple this saving to the increased productive output of the pneumatic tools, and it is easy to see that it pays to keep the air lines tight.

Heavy-Media Separation

(*From page* 96)

stacker, while the oversize goes on downhill by a 30-in. by 3,239-ft. long conveyor to the 6,000-ton live-storage surge pile ahead of the new H.M.S. plant, recovery being *via* a 30-in. by 380-ft. tunnel belt.

Preceding the H.M.S. plant is a preparation plant consisting of a Hardinge 66-in. by 10-ft. conical scrubber followed by a 6- by 6-ft. trommel carrying 4½-in. round-hole punched plate. Oversize goes to a Pacific 18- by 36-in. jaw crusher in closed circuit with the trommel, while the throughs are sized and washed over a Ty-Rock 5- by 10-ft. 2-deck spray-equipped screen. Minus 3/16-in. dolomite and contaminant fines are wasted along with the dirty water, the desired 4½- by 3/16-in. rock being utilized as H.M.S. plant feed, or, in the event the material is of such high grade that beneficiation is deemed unnecessary, it may go direct to the kiln department *via* a flop gate following the screen.

A belt conveyor carries the dolomite to the H.M.S. plant for beneficiation, discharging the rock directly into a Wemco 18-ft. cone separator. The vessel is filled with the medium which consists of finely-ground ferrosilicon plus a small amount of magnetite in water, the agitated solution being maintained at a specific gravity in the 270-275 range. The concentrate (high-grade dolomite) sinks in the medium while the tailings rise and float. An air-lift raises the desired sink product to a launder at the top of the cone, while the light constituents overflow the weir to another launder, both the sink and the float passing to separate longitudinal sections of a pair of Allis-Chalmers 5- by 12-ft. Low-Head screens in series, another pair in like arrangement handling only the sink. Float is carried to waste by a 24-in. by 354-ft. belt conveyor, while the sink goes to the kilns *via* a 30-in. by 1,000-ft. conveyor, production being recorded by a Merrick Weightometer.

During the initial 8 ft. of travel over the first screens the medium is drained from both sink and float fractions and returned to the separatory cone by a Wemco pump. The remainder of the screen areas are fitted with sprays which wash off any remaining medium. This dilute medium passes a set of magnetizing blocks to promote flocculation before entering a Wemco 20-ft. diameter thickener for partial dewatering. Underflow from the thickener is pumped to a pair of Dings magnetic separators, for primary and secondary removal of the magnetic concentrates which pass to a Wemco 48-in. densifying screw for final dewatering. The reclaimed medium is stored by

(*Continued on page* 101)

When May Equipment and Improvements Be Removed from Leased Premises?

By LEO T. PARKER

Attorney at Law
Cincinnati, Ohio

RECENTLY, when traveling through the West, I learned that many nonmetallic minerals plants are being operated on leased property, and many of these operators are worrying whether they will be lawfully privileged to remove equipment and improvements such as machinery and buildings from the leased premises when the lease contract expires.

Some of these operators and officials explained that their lease contracts contain clauses to this effect. Others have only verbal agreements; and some have no agreements at all, but take it for granted that they can remove all equipment and improvements when the lease expires. The purpose of this article is to review important phases of the law on this subject, so that in the future readers may refer to it as a dependable guide when making lease contracts. The latest and leading higher court decisions are hereinafter cited to verify all my explanations of the law.

Legal Problem As nearly as I can remember it, the following is a legal problem presented to me by a reader. He said, "Approximately ten years ago I leased a building for 10 years. A clause in the lease contract states that at the termination of the lease I have the privilege of removing the building, all improvements, equipment, machinery, etc., installed during my occupancy. Now that the lease is near termination, the holder of the mortgage, who last year loaned money to my landlord (the owner of the leased property), refuses to allow me to dismantle and remove the equipment, machinery, etc., which I installed in the building. The sellers of some of this equipment hold mortgages or conditional contracts to secure the unpaid balance I owe. Some of the equipment has been fully paid for. What are my legal rights?"

The answer to this reader's problem involves numerous legal complications and technicalities. However, I shall review late and leading higher court decisions that will clearly answer this and other similar questions.

First, if the lease contract between this reader and the property owner very clearly explains that all equipment, machinery, etc., may be removed at the termination of the lease contract, and this lease contract was properly recorded or

Leo T. Parker

brought to the attention of the mortgagee before he loaned money to the property owner, under these circumstances, the equipment and machinery may be removed unless its removal will permanently damage the leased building.

The following is a brief review of the law on "liens" created by chattel mortgages and conditional contracts of sale.

Modern higher courts consistently hold that both conditional contracts of sale and chattel mortgages properly recorded in any county in any state in the United States are valid and effective in all states in the whole United States. On the other hand, an unrecorded conditional contract of sale or mortgage is valid with respect only to persons who have knowledge of it.

In *Roesch v. Mark*, 35 Atl. (2d) 774, a tenant purchased certain equipment under a conditional contract of sale which the seller failed to record. The tenant installed it in a leased building. Later the landlord contended that he became the legal owner of the equipment because it was installed in his building and also because the conditional contract of sale was not recorded.

However, the seller proved (1) that the equipment was not permanently attached to the building and (2) that the landlord knew the tenant had purchased the equipment under the encumbrance of a conditional contract of sale. Therefore the higher court held that this "knowledge" of the landlord was equivalent to legally recording the contract. Hence, the court held that the owner of the building was not the legal owner of the equipment and either the lessee or the holder of the conditional contract could remove it. The court said, "The testimony was sufficient to establish the fact that, although the conditional sales agreement was not filed, the landlord had actual knowledge."

Therefore, without going into great detail the court established the law that either a chattel mortgage or a conditional contract of sale held by a seller who sold to a tenant equipment or other products not permanently attached to the building is valid and enforceable if it was properly recorded in the county where the equipment is situated, or if the one who claims ownership had knowledge of the lien. This is law, however, not always applicable to equipment and devices installed permanently in a building, a fact to be explained later in this article.

Intentions Are Important Let us assume that leased property is not mortgaged or otherwise encumbered either before or after the lease contract is signed.

In deciding whether the operator of a nonmetallic plant may at the termination of the lease contract remove equipment, machinery, crushers, conveyors, buildings, etc., the courts always endeavor to interpret the original intentions of the parties.

For example, in *Chabon v. Lozarns*, 87 Atl. (2d) 435, the testimony showed facts as follows: One Chabon leased certain real estate from an owner and constructed certain buildings and other improvements on the land. When the lease

contract expired, the property owner refused to allow Chabon to remove the buildings and improvements.

The lower court refused to hold that Chabon could remove the improvements from the land because Chabon failed to prove that both the landlord and he "originally intended" that the improvements made by Chabon could be removed.

"The method of annexing to the freehold must be taken into consideration," the court stated. "How extensive and deep are the foundations? Is the building kept in place by its own weight or is it fastened to the foundations by screws and bolts? The cost of restoring the property to its original condition is also a factor, for the tenant cannot leave the property in a worse condition than it was in when he rented." This last sentence applies only if the lease contract does not clearly specify what the tenant may do. Obviously, a lease contract is valid irrespective of foolish clauses to the detriment of the property owner if he intends that such clauses be a part of the contract. Naturally the court will assume that he "intended" to be obligated if he willingly signed the contract.

For comparison see *Pope v. Shinkle,* 45 N.J.L. 39. Here a leasee tenant erected certain frame buildings on the leased property. In subsequent litigation the court held that as the testimony indicated it was the "intent" of both the tenant and landlord that the tenant could remove the buildings at the termination of the lease contract, the landlord could not prevent removal of the buildings. According to the court, "Whether the building was personalty or realty would depend on the intention of the builder and land owner."

The following higher court cases are also applicable: *King,* 68 A 162, 14 L.R.A., N.S. 439, and *Forkes,* 46 Atl. (2d) 62. These courts held that if a tenant proves by verbal testimony or if he has a written contract which provides that at the time the lease was made both the landlord and tenant intended that the tenant could remove from the land the buildings or other improvements, under these circumstances, as between the tenant and landlord, the former may remove them from the real estate.

Damage Liability According to a late higher court decision, if anyone including a lessee unlawfully removes equipment, buildings, and the like from leased property, he is liable in damages.

For illustration, in *While v. Wills,* 51 N W (2d) 353, it was shown that certain equipment was installed by a leasee in a leased building. This equipment included coils, pipes, fittings, valves, gauges, thermostats, etc. The pipes and coils were fastened to the walls and in places the pipes penetrated the floors and the concrete walls between the rooms.

The higher court held the property owner entitled to recover $100 damages for cleaning up the premises and $4,700 damages arising from removal of the equipment, since the leasee had no provable contract that originally the landlord intended to allow him to remove the permanently installed equipment and machinery.

For comparison see *Woods,* 106 Pac. 730. Here it was shown that a tenant constructed a brick vault and installed a safe in the vault, by permission of the owner of the building. The higher court held that when the tenant's lease expired, he could tear the vault to pieces and remove it and take the safe from the building if he replastered the walls and left them exactly as they were when he leased the building. In the case of *Smith,* 121 Ala. 335, a lease contract contained a clause that at the termination of the lease the tenant could remove from the premises all equipment, improvements, and devices he had installed during occupancy. The higher court held that the tenant could remove the equipment he had installed, although he found it necessary to use pickaxes and chisels to cut away partitions and the vault.

Similarly, in the case of *Merchants,* 167 Ill. App. 315, the higher court held that a tenant could remove from a leased building equipment that weighed 40,000 lb. In this case there was no contract which authorized the tenant to remove the equipment. But the testimony showed that equipment and machinery could be removed without damage to the building. Hence the court held that the tenant could remove them.

No Agreement If there is no agreement between the landlord and the tenant as to whether the latter may at the termination of the lease contract remove equipment, machinery etc., he still may remove them if in doing so he does not damage the building.

In the case of *Charette v. Bank of Shelbyville,* 291 S. W. 1054, the higher court held that an engine is a "chattel" and does not become a "legal fixture" in a building if it may be removed without injury or damage to the building. In this case the owner of the building contended that he had not agreed to permit the tenant to remove the engine from the premises and therefore the tenant could not remove it. However, since it was not permanently affixed to the real property, the higher court held that it could be removed.

"In determining whether fixtures are in law immovable or not," the court pointed out, "there are, as the parties to this appeal agree, three general tests: (1) annexation to the realty, either actual or constructive; (2) adaptation or application to the use or purpose to which that part of the realty to which it is connected is appropriated; (3) intention to make the article a permanent accession to the freehold."

For comparison, see *Reno Electrical Works v. Ward,* 274 Pac. 196. Here it was disclosed that a tenant attached 20 electric fans to the walls of a leased building by brackets. Litigation developed when the landlord objected to the removal of the fans because the brackets were nailed and screwed to the walls. However, the court held that fans attached in this manner to a building are not legal fixtures.

"It is true the insulating material was secured to the walls of the building by screws and nails," the court stated, "but not so secured that the fans and materials cannot be removed without injury to the insulation, and also the building."

Legal Rule In view of the above explained higher court decisions, it is quite apparent that a legal rule may be used by readers to determine their legal rights, as follows: Chattel mortgages and conditional contracts of sale, when properly recorded in a county, are valid and effective in all counties in all states in the United States. Any chattel or personal property not permanently attached to a leased building may be removed at any time. A chattel attached permanently to a building may be removed by the tenant if the lease contract contains a clause giving the tenant this privilege; and, further, if the building owner does not sell nor mortgage it. This is the general law. However, it is not the law with respect to a new purchaser of the building; or with respect to one who holds a mortgage on the building. Under these circumstances the tenant may lose his right to remove

his "legal fixtures" from the building.

The latest higher court decision involving this important point of law is *First National Bank v. Nativi*, 49 Atl. (2d) 760. The testimony in this case showed that one Booth conducted a business on his own property. A compressor and motors were used to furnish air and electric power for the business. Booth mortgaged his real estate to a bank and later purchased an air compressor and two motors which were installed in the main building. Concrete bases were constructed on which to place the compressor and the motors in order to lessen vibration.

After the installation of this new equipment the bank contended that Booth could not remove the equipment from the building. The bank's contention was that although the equipment was not on the property when its mortgage was signed, the equipment is a "legal fixture" which belongs to the real property. This contention was vigorously denied by Booth and a lawsuit resulted. The higher court held that this equipment belonged to the bank although it was not on the premises when Booth mortgaged the real property to the bank.

This court held further that when a building, real property, or premises are specially adapted to certain uses, all machinery permanently installed which is essential to the purpose for which the building is used belongs to the building and real property because it is a legal fixture.

However, in *Cristine v. Gulf Ice Company*, 55 So. (2d) 685, the following facts were recorded. The owner of real estate mortgaged it. Later he purchased a portable crusher on wheels. This crusher was installed on a platform and the wheels were fastened by nails and bolts to wooden blocks. The seller held a mortgage to secure installment payments due on the crusher.

The holder of the mortgage foreclosed because the property owner failed to meet his obligations and interest payments. A legal controversy arose over the legal question whether the seller could repossess the crusher.

The higher court held in the affirmative saying: "Here the machine had blocks to keep it from rolling. It would seem that the machine could be removed from the real estate without any material injury to the real estate whatsoever.

In the case of *Stone v. Doris*, 51 N. W. (2d) 873, a land owner and a tenant signed a lease contract which contained a clause to the effect that the leasee or tenant could remove any and all "improvements" constructed on the premises. Later the leasee subleased a part of the premises.

In subsequent litigation the higher court held that notwithstanding this clause in the lease, a mechanic who installed improvements on the real estate for the subleasee, could remove them for non-payment for his work, if the testimony showed that the subleasee, the leasee and the property owner, or any of them stood by and allowed the mechanic to install the improvements without informing him that this clause was in the lease contract.

Variations of Law Here are a few interesting variation of the law: In *Citizens*, 216 Ind. 573, it was shown that a man named Ellis purchased several machines and erected them in a leased building without attaching them permanently to the building. In fact these machines were held to the floor by their own weight. In subsequent litigation the higher court held that the leasee could remove the machines from the building, although a new purchaser of the building objected to the removal.

In the case of *Day*, 194 Atl. 53, the higher court held that either the leasee of a portable boiler, or the seller who held a lien on the boiler, could remove it from the building although the holder of a mortgage believed that his mortgage covered the real premises and all equipment on the premises.

In a third case, *Sunshine*, 122 N. J. Esq. 381, Meala loaned a considerable sum of money and for security took a mortgage on a building and land. This mortgage contained a clause that the mortgage covered the building, land and "all boilers, pumps, motors, fans and other machinery" on the premises. (In other words, the owner of the real property guaranteed to the lender of the money that the mortgage was a lien not only on the building and land but also on all chattels, legal fixtures, etc., in the building and on the premises.)

The higher court held that a tenant who had purchased machinery and installed it in the building could remove it when he desired to do so, although it was very heavy and a door frame had to be altered to remove it from the building. This court said that a seller or mortgagor of a building cannot possess another's chattels on the premises, unless the testimony shows conclusively that such chattels are permanently attached to the real property and cannot be removed without considerable alteration or damage to the building.

Heavy-Media Separation

(*From page* 98)

gravity in a sump beneath the screens for re-use in the cone separator, first passing a set of demagnetizing coils. The initial charge of ferrosilicon-magnetite was 90 tons, and the loss after several months of operation appears negligible.

Operating results to date confirm data obtained from the preliminary tests. Feed to the plant may assay as high as 16 percent SiO_2 and contain proportional amounts of R_2O_3. Finished-product assays average approximately 0.5 to 1 percent SiO_2, and less than 1 percent R_2O_3.

At the kilns the dolomite is fired, or calcined, in varying degrees to suit the requirements of the end product. Kilns No. 1 and No. 2, the older burning units, are 8- by 299-ft. and were supplied by F. L. Smidth & Co. Kiln No. 3, installed in 1951, is a Traylor 9½- by 250-ft. unit with a Smidth 30-ft. long addition at the firing end, giving it an installed length of 280 feet. All three kilns are equipped with Unax coolers.

Kiln products consist of (1) dead-burned dolomite, sold to the Western open-hearth steel industry, (2) hard-burn calcined, shipped to the Kaiser-operated magnesium-metal plant at Manteca; light-burn calcined, used at the Moss Landing seawater plant, and (3) high-magnesian lime and hydrate.

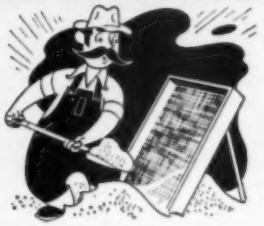
Crushed raw dolomite for sale to the building, agricultural, and industrial trade is also produced in a wide range of sizes.

Kaiser Aluminum & Chemical Corp. maintains its headquarters in Oakland, Calif. J. F. Knight is works manager, and D. M. "Mac" Kerr is general superintendent of the Natividad and Moss Landing operations. Jack D. Moore is the Natividad plant superintendent.

The Moss Lightweight Aggregate Company, Memphis, Tenn., has obtained a $500,000 loan from the Reconstruction Finance Corporation for a building and equipment to produce lightweight aggregate for airport runway construction. The company is a subsidiary of John A. Denies' Sons Company, Memphis, Tenn.

The regional wage stabilization board recently approved a 15-cent hourly pay increase for 382 A.F.L. union employees in the building material, sand and gravel, and ready-mix concrete industries in Minneapolis, Minn.

Screenings



by William M. Avery

ACCORDING to a report we read the other day, dishonest workers, "lured into crookedness by gambling, fast women, and liquor, among other temptations", cost American employers more than $500,000,000 a year. Despite the Victorian language, the supporting data appear to be reasonably contemporary, and so we're passing on some of the highlights for the general amazement of our readers.

After making the flat observation that no man can be called honest or dishonest, the report goes on to say that any one or several of more than 200 possible factors may exert the pressure which causes a nominally honest employee to deviate. The main factors, however, are "fast women" (a term we thought had expired back in the 23 skidoo era), horse race betting, excessive drinking, and living beyond income.

In order, presumably, to enable employers to eliminate potentially dishonest employees before they succumb to such pressures, the report includes what it calls a profile of the average dishonest employee. "He is a man, because men cause 93 percent of all dishonesty losses. He is 35 years old and has been employed nine years and three months. He was on the job for six years and five months before he stole his first dime. Then he continued his thefts for three years and two months before he was caught."

Well, there you have it, fellows. You can cut out 93 percent of your losses from embezzlement, fraudulent conversion, theft, and other crimes by dishonest employees just by firing all the men on your payrolls. If *we* were doing it, we'd replace 'em with those fast women who start all the trouble in the first place. Might even slow 'em down a notch or two.

Labor Pains

ABOUT $200 worth of ready-mixed concrete was poured into a city dump at Terre Haute, Ind., the other day when pickets prevented several truck mixers from entering the construction site for which the material was destined. Any way you look at it, it's a strange world. Truck designers work like blazes to produce equipment that can go through hell and high water, and then a couple of Joes with a grievance can nullify their entire effort just by waving picket signs. Maybe that helicopter transit-mix-service scheme we were kicking around a few months ago isn't such a wild idea after all.

Or Shake Gently

THE owner of a herd of Hereford cattle has filed suit against a quarry operator whom he accuses of strewing the animals' pasture with dynamite stick wrappers and fragments of dynamite. He claims this unorthodox diet depreciated the value of the cattle.

We hope the powder manufacturer will come forth with irrefutable proof that the material and its wrapping was vitamin—enriched in anticipation of just such a contingency. No doubt, drug stores in the area have been advised to go easy on milk shakes for a while.

Genius At Work

COMRADE Joe Stalin recently boosted his batting average for *ex post facto* accomplishments in the field of invention by awarding the Stalin Medal for 1951 to a Russian for developing a vacuum process for the quick hardening of concrete. The process was actually invented by Karl P. Billner, president of Vacuum Concrete, Inc., who first demonstrated it to engineers and architects at Yale University in 1937. Later, in 1944, he turned it over to the Russians under Lend-Lease.

What we're curious to know is why in heck it took the Russians seven years to invent the process after it was handed to them on a silver platter. Only explanation we can think of is that they've just been too busy inventing the steam engine, the electric light, the cotton gin, the wireless telegraph, and a few other odds and ends.

Feet of Clay, Maybe

WE don't know just what the purpose may be, but we learned recently that the *third* annual National Clay Week has been observed at Columbus, Ohio. It might be assumed that the first two fracases accomplished an objective sufficiently useful to justify a third try, but so far as we've been able to find out the unique achievement of the Columbus frolic was the selection and crowning of a Miss Clay of 1952.

So far as we can judge from photographic evidence, the recipient of this signal honor appears to have been formed from the same sort of clay that goes into the fashioning of all beauty queens, but the matter clearly requires investigation at close range.

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It's really something to see—the way a Mack six-wheel truck shoulders a back-breaking load and without fuss or bother rolls effortlessly over the roughest terrain.

The reason why? Because only Mack six-wheel trucks have the unique advantage of Mack's time-saving, money-saving Balanced Bogie with exclusive Mack Power Divider.

With the Mack Power Divider you get positive traction under the most adverse conditions —through hub-deep mud, through slippery sand, or over rock-strewn uneven ground. Acting as a true differential, the Power Divider delivers torque between the two bogie axles and between the four driving wheels in proportion to wheel traction, thus eliminating useless wheel slippage and spinning.

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MEN OF THE INDUSTRY—

McCaslin, Portland's First Citizen

THE best way to describe Frank E. McCaslin is Mr. Portland, for Mr. McCaslin, president and general manager of the Oregon Portland Cement Company, has served his city in so many ways that it's next to impossible to name a civic position he hasn't held. His tireless efforts for the building of a better Portland culminated in his being named the city's First Citizen of 1951.

Born in Lake Wilson, Minn., where he received his early education, Mr. McCaslin interrupted his high school studies to take a complete college business course at the California Commercial College in San Diego. He supplemented this with later studies at George Washington University in Washington, D. C.

He worked briefly for the United States Agriculture Department's Bureau of Animal Industry and after service in World War I moved to Seguin, Tex., where, in partnership with a friend, he took leases on two hotels.

But it was a vacation trip to the Pacific Northwest which was responsible for Mr. McCaslin's biggest decision. In the summer of 1922 he went to Oregon and after one quick look decided that this was the place for him to settle. He did, and he's been there ever since.

A year after the big move, in 1923, he joined the Oregon Portland Cement Company in the accounting department. Frank McCaslin rapidly rose through various positions in the company and was elected assistant secretary-treasurer in 1927. Four years later (1931) he became a member of the board of directors, and in 1937 he was elevated to the position of secretary-treasurer. After another four years his election to the vice-presidency occurred in 1941; and a year and a half later he succeeded to the presidency of the company upon the death of L. C. Newlands.

Under Mr. McCaslin's leadership the cement company, which produces crushed limestone and agricultural limestone in addition to cement, has doubled the output in its two plants. There are about 300 employees in the plants.

His devotion to civic duty became evident in 1933 when he headed the Portland Junior Chamber of Commerce and the President's Council. The latter is composed of presidents of the city's numerous civic and commercial clubs.

In 1939 he headed the Portland Rose Festival and he has served

Frank E. McCaslin

on the board for the event practically every year since. During World War II he was chairman of civilian war services for the Portland-Multnomah County Civilian Defense Organization. He was an original director of the Portland Labor-Management Committee and continues to serve in that capacity.

After service as an officer and member of the executive committee of the Portland Chamber of Commerce, he was named president in 1945. Immediately he embarked on a campaign, which he waged almost singlehanded, to raise $75,000 for a tourist promotion fund. Typical of Mr. McCaslin's ventures, this one was also successful. It enabled construction of a unique Visitors' Center Building along the city's Harbor Drive.

Since that time he has served as general chairman of the Red Cross Drive and the Portland Community Chest campaign, president of the Pacific Northwest Trade Association, and president of the Community Chest for two years.

The esteem in which Mr. McCaslin is held by his fellow Portlanders is shown by this report from the committee of the Portland Realty Board which sponsors the annual First Citizen Dinners:

"Quiet, unassuming, dependable, painstaking, and a man of highest integrity, Frank McCaslin has never been a self-advertiser, nor one who could ever show any flair for the dramatic spotlight. He has never expected any thanks for his many evidences of intense loyalty to his friends and his unfailing devotion to the worthy causes his very heart has been in. He will undoubtedly be the most surprised man in all Portland when he learns he has been tabbed as First Citizen of the Year.

"The quality your committee admires most in Frank McCaslin might be styled as his 'follow-through'. His wholehearted support of the enterprises and activities he is identified with are not casual and transient but, rather, earnest and ever continuous, not annual but seemingly perennial. Long after he has served as captain, so to speak, he does not lessen his effort or rest on his laurels but, rather, stays on the team and works just as hard as ever—happy, indeed, if his sucessors at the top level equal or even excel his own records of achievement."

Mr. McCaslin became a director of the National Chamber of Commerce last April when he was chosen to represent District 10. He is chairman of the United States section of the Joint Northwest Development Committee and a member of the Natural Resources Canada-U.S., and Construction and Civic Development Committees.

He was married in 1925 to the former Lillian Lucile Sneed. They have one son, Frank E. Jr.

Mexican Government's Move Penalizes Cement Profiteers

Mexican cement quotations dropped 50 pesos ($5.81) a ton following joint action by the General Price Bureau and the Cement Manufacturers Association. The rate is now 190 pesos ($22.09) a ton. The government's price-fixing regulations were invoked to fine retail outlets selling at prices above official ceiling limits.

Sufficient quantities of cement are now available for immediate delivery. Intermediaries had been creating artificial shortages during the past few months, it was charged, based on rumors that the nation's 18 plants were unable to meet demands.

It is pointed out that production this year, estimated at over 2,000,000 tons, will even leave a sufficient surplus for export. Last year tentative exports on a minor scale were made to the United States and Central America.

How many different oils and greases do you now carry to keep your quarry machinery running?

With Shell's "3-Barrel" plan you need only *three*!*

*SHELL RETINAX A GREASE

. . . a superior new multi-purpose grease for all types of heavy-duty automotive vehicles. Shell Retinax A Grease does the job of four or more specialized greases—yet only one gun is required. Recommended for all grease-lubricated points on chassis, wheel bearings, universal joints, and water pumps, Shell Retinax A gives you better protection against excessive wear and washing out.

*SHELL SPIRAX EP†

. . . an exceptional "alloy type," Extreme Pressure gear oil. Shell Spirax EP is recommended for rear axles of the hypoid, spiral bevel, and spur gear types . . . and heavy-duty transmissions. It is extremely stable . . . has long-lasting anti-rust and film strength properties. Results: longer gear life, lower maintenance costs.

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. . . for all engine crankcase lubrication, Shell Rotella Oil is a new, fortified, extra heavy-duty lubricant which has set new standards of anti-wear, anti-fouling performance in high speed diesel and heavy duty gasoline engines. By maintaining clean engines and minimizing sludge formation, piston lacquering, ring and valve sticking, and port clogging, Shell Rotella Oil extends periods between overhauls, reduces parts replacement costs, and gives you reduced oil consumption.

†Some manufacturers recommend a straight mineral oil for gear lubrication. Your Shell Lubrication Engineer will suggest the proper lubricant in such cases.

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SHELL "3 BARREL" LUBRICATION

Report on Current Labor Developments

New Problems of Association Bargaining

By S. HERBERT UNTERBERGER

S. Herbert Unterberger & Co.
Industrial and Labor Economists
Washington, D. C.-Philadelphia, Pa.

WHEN faced by the same labor union, small and moderate size businesses have frequently found distinct advantages in joining together in an association for the purpose of collective bargaining. Many such arrangements are found in the pit and quarry industries. They have thereby been able to present a stronger and more united front and also they have been able to pool their resources to employ skilled specialized bargainers, and legal and other counsel. In general, this has frequently been a convenient and efficient arrangement, not only for the employers but also for the labor unions. Indeed, in some cases, the labor unions have insisted that newly unionized employers join the association so as to expedite collective bargaining.

Association bargaining has certain drawbacks, as well. An employer who becomes a part of such an arrangement gives up some of his ability to determine the conditions under which he will operate. His position may be outvoted in the association and he may be required to go along with a course of action with which he does not agree. If he were free to bargain independently, he might, under certain circumstances, be in a position to make a more advantageous bargain. He may find himself in a situation where he is required to make important information available to his toughest competitors. Nevertheless, association bargaining has continued because in many places its advantages clearly outweigh its disadvantages.

To counteract one of the most important employer advantages of association bargaining—the united front—labor unions have increasingly resorted to the technique of bargaining with the association but striking only one or a few members. Their strategy is to get the struck members to apply pressure on the entire membership to settle on the union's terms.

The first inclination in such a situation is for the association members to try to adopt an "all or nothing" rule. From a strategic point of view, the most advantageous action of the employers would be for all to shut down when one is struck. There are, however, formidable legal obstacles to that course.

Initially, it was thought that the principal obstacle would be the anti-trust laws. The fear was that such concerted action would be deemed a "restraint of trade". While this danger still exists, the anti-trust aspects of the situation have not been tested fully because the unions have found a simpler remedy in the federal labor law. Anti-trust actions are notoriously lengthy and complex. Although the National Labor Relations Board is not famed for its speedy action, it has been used because its processes are far more accessible.

Accordingly, when, after a union struck one association member and then the others laid off their workers, the unions claimed, before the N.L.R.B., that the employers had discharged them because they belonged to a union. Such a discharge would be illegal.

In a case decided early last year by a Court of Appeals it was made clear that employers who are members of an association were not permitted to discharge their union employees because the union had struck another member of the association. The question of whether they could lay them off without discharge was not fully settled.

Recently the National Labor Relations Board considered a case in which an employer who was a member of an association temporarily locked out all of his union members when the union struck another member of the association during collective bargaining. The majority of the Board ruled that even though only a temporary lay-off or lockout was involved, the employers, nevertheless, were guilty of a discriminatory act. This ruling may also be appealed; but until the matter is settled again in the courts, it stands.

The chairman of the N.L.R.B. dissented from the ruling because he did not believe that a "temporary lockout, motivated by a desire to counteract a union-directed stoppage rather than by an intent to interfere with concerted activity, constituted a violation of the amended Act. . . Here the parties had reached an impasse, and it was the union which took the initiative in selecting the particular weapons of economic combat. The employers did no more than defend themselves with commensurate weapons; they refrained from ultimate, and to my mind unlawful, instrument of discharge. I am unwilling to infer a wish to destroy from an attempt to resist, to do battle and to win." Despite his eloquence, the chairman's position did not prevail.

In another recent court case, the liabilities inherent in subscribing to the actions of an employers' association were also highlighted. Here the court made it plain that if an employer does not want to be bound by the agreements made by an employer association, he must make that abundantly clear to all the parties involved.

An employer who made payments into a welfare fund in accordance with the agreement made by an association of which he was a member had, the courts ruled, ratified that agreement. When the agreement was renewed and the welfare fund payment increased, he could not then refuse to pay. Essentially the court said that an employer is bound by a collective bargaining agreement entered into by an employers' association of which he is a member if the conduct of the employer leads the union to believe that the association has authority to enter into the agreement on his behalf, and if the conduct of the employer induces the union to forego the right to bargain collectively with the employer independently of the association.

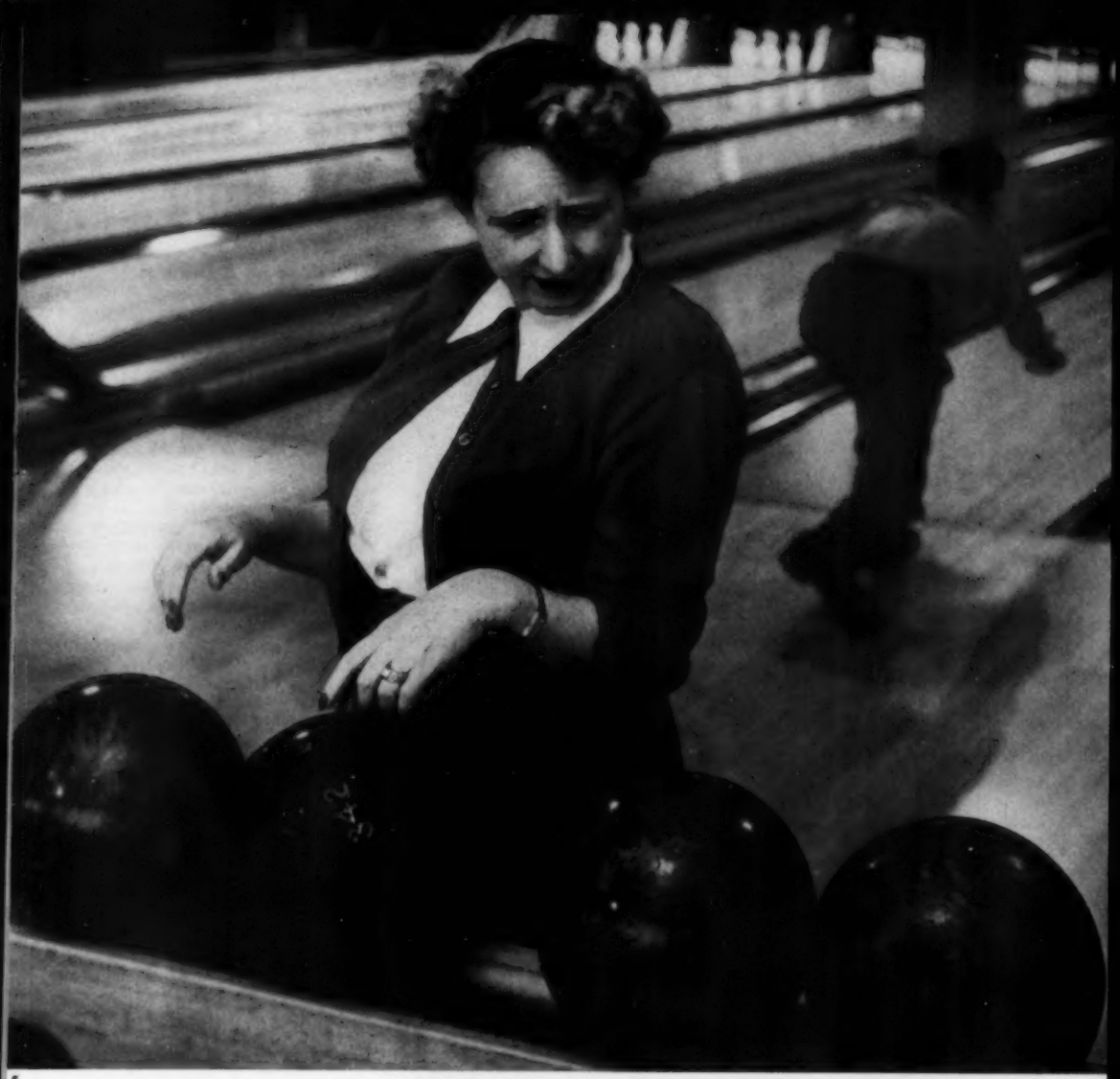
The basic forces which drive employers together into an association for collective bargaining continue, and, as a matter of fact, appear to be intensifying. As a consequence, this kind of arrangement is becoming more widespread. And, as always happens when an institution grows in prominence, a special set of restrictive rules is developing to limit its power.

Current Cement Production Hits New Highs in Canada

The current year is establishing new all-time records for Canadian production of cement and shipments to customers.

A reduction in imports also indicates the greater extent to which the several recent increases in capacity of Canada Cement Company at various plants, up to a present capacity of well over 17,000,000 barrels per annum, is enabling the company to satisfy the "rush" demand that seasonally develops in May, June, July, and August.

The month of May showed production slightly up over last year, at 1,534,455 bbl., against 1,524,840; but shipments to customers (calling upon stockpiles as well as the month's output) rose 130,000 bbl., from 1,880,084 to 2,010,570.



Emma, won't you please make up your mind!

Even the rankest tyro quickly discovers that all bowling balls aren't exactly alike.

The serious bowler often buys his own. He chooses it for fit, balance, trueness. His ball and another might look like twins, but chances are he can tell them apart blindfolded.

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An increasing number of major buyers of Multiwalls are specifying Union as the best all-around value.

Sturdy Union kraft is of consistent quality, made from pulp from Union's own forests. Union's engineered manufacturing methods, in the world's largest integrated pulp-to-container mill, guarantee uniformly high standards and precision construction. And Union Multiwalls have maximum strength, verified by their outstanding performance record in use.

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Lime Operators Cover Wide Range Of Problems At Seventh Meeting

ALMOST a hundred members of the National Lime Association, many of whom were accompanied by their wives, attended the seventh annual meeting of the organization's

By WILLIAM M. AVERY

Operating Division at Mountain Lake, Va., during the month of September. The somewhat unusual location, a remote resort hotel perched on the very summit of a mountain some 4,500 ft. above sea level, was necessitated by the group's desire to visit the modern lime plant operated by the National Gypsum Company at nearby Kimballton.

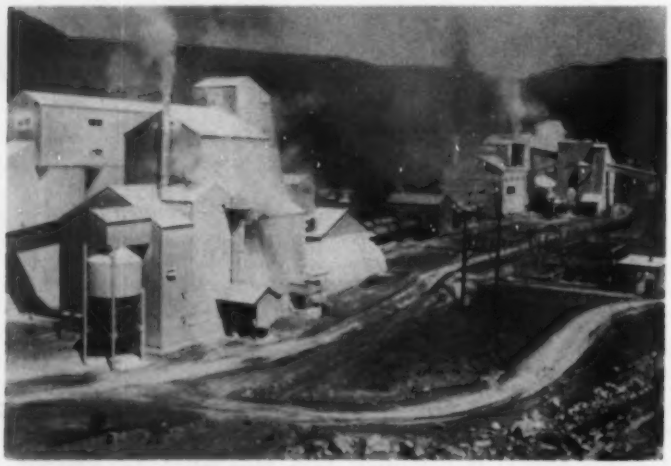
The three-day gathering, from September 15 to 17 inclusive, covered a wide range of technical subjects, and featured papers prepared and presented by a number of guest speakers as well as active members of the Association. There were also excellent panel discussions, with active audience participation, covering such topics as accident prevention, human relations in industry, and contract negotiations. Amos B. Miner and F. C. Mallery, both of the National Gypsum organization, served the Operating Division as chairman and program chairman, respectively.

F. C. Mallery, National Gypsum Co., Luckey, Ohio, program chairman for the meeting at Mountain Lake, and Amos B. Miner, also of National Gypsum Co., retiring chairman of the Operating Division of N.L.A.

In opening the first session on quality control, Mr. Miner recalled some of the details of the initial meeting of the Operating Division. At the time of the first meeting, Mr. Miner said, many of the members seriously doubted that technicians in a highly competitive field could be brought together for a free exchange of ideas, and he pointed out the sharp contrast between this view and the fine record of intimate cooperation which the group has built up in the seven years since it was formed.

Selective Calcination The first speaker, Professor W. H. MacIntire, head of the chemistry department at the University of Tennessee, discussed the catalytic role of steam in lessening temperature and duration of fluocalcinations of limestone fines. Professor MacIntire has conducted extensive experimental work in search of a means of selective calcination of dolomites which would break down $MgCO_3$ to the more readily soluble MgO without disturbing the $CaCO_3$ content. He has achieved this objective, which most industry authorities once regarded as unattainable, by using steam as a catalyst in an indirect (no flame contact) calcination process.

In experimental runs, Professor MacIntire said, an ordinary Traylor 3- by 20-ft. cast-iron dryer was used as a rotary kiln, and the dolomite charge was placed in a cast-iron tube. The unit was oil-fired and steam was injected at 200 deg. C. to serve as a catalyst. A complete reaction, showing less than one percent of free lime, was obtained within 15 minutes. According to Professor MacIntire, the end product of his selective calcination process hydrates more readily, and is more workable into pastes, than material burned in the conventional manner. With steam replacing air, the speaker said, the dolomite bond actually disrupts at about 550 deg. C. The material produced in this manner is exceedingly active and must be packed in steel containers rather than in bags.



A general view of National Gypsum's modern rotary kiln lime plant at Kimballton, Va., where members of the Operating Division enjoyed a busman's holiday tour during their three-day meeting.

Heavy Media Separation D. M. Kerr, general superintendent of Kaiser Aluminum and Chemical Corporation, described briefly his company's three integrated plants in the Salinas, Calif., area for the production of dolomite, sea water magnesia and basic magnesium. In the dolomite operation, Mr. Kerr said, considerable difficulty was encountered because of the occurrence of granite dykes and other intrusions running in all directions throughout the deposit.

This problem was initially coped with by means of selective mining and by dry-screening the materials after primary crushing. Even with the greatest care that could be exercised, however, a high waste ratio

was found to be almost inevitable, and the selection of rock at the face became increasingly difficult and burdensome as the quarry was extended.

Because heavy-media separation seemed to offer the most efficient means for solving the problem, an installation for this purpose has just been designed and built. The primary units consist of a separation vessel, a pump for circulating the media (ferro-silicon), screens for washing the media from the rock, and facilities for concentrating and reclaiming the media. The results, Mr. Kerr said, have been most satisfactory. Not only is it now possible to obtain a very pure product, but the reduction of waste assures that the effective life of the quarry will be extended many years.

In the installation at Natividad the removal of silica (SiO_2) is the primary objective. On feed ranging from one percent to as high as 7 percent silica, sinks run quite consistently below one percent silica. The heavy-media separation plant has a capacity of 140 to 160 tons of finished product per hour, and costs according to Mr. Kerr, run well below 50 cents per ton.

Instrumentation and Control *Instrumentation and Control of Rotary Lime Kilns* was the subject of a paper presented by Irving Warner, vice-president of the Warner Company, Philadelphia. Since his 1948 discussion of the same subject, Mr. Warner said, he has rebuilt and instrumented his company's No. 2 kiln (on high-calcium lime) at Bellefonte, constructed a No. 2 kiln (on dolomite lime) at Cedar Hollow, and combined the control panel board of No. 1 kiln with that of No. 2 kiln at Cedar Hollow. Despite this extensive additional experience, he believes that his basic views on instrumentation and control have not undergone any significant change.

Professor W. H. MacIntire, University of Tennessee, Knoxville, who discussed the catalytic role of steam in the calcination of limestone fines.

The speaker expressed the view that too many records can be almost as undesirable as too few. In selecting kiln instruments he suggested that only those be included which serve to accomplish one or more of the following purposes:

a) Protect machinery
b) Provide help for the operator or in training new operators
c) Provide information in the form of charts which will enable the supervisory force to see what has happened
d) Provide information which will enable the engineer to study long-range results and changes in operating practices.

According to Mr. Warner, it is advisable to avoid excess instrumentation which provides data that are merely interesting but without immediate value. He believes that indicating instruments should be as large as possible for the sake of readability, and that round charts with large indicating arrows are best in this respect. Strip potentiometers, the speaker said, should be limited to four points, and should employ not more than three colors—preferably red, green, and black. All the temperatures for one kiln should be on one chart for ease in making comparisons, but instrumentation for contact coolers and preheaters may be handled separately.

Mr. Warner urged that instruments be calibrated so far as possible, so that the normal reading is about 50 percent of the total scales. As exceptions to this rule, however, he noted that draft-gauge readings are frequently less than 50 percent of the total scale provided, and that the tachometer is calibrated for a 100 percent reading at maximum kiln speed.

Some other points which the speaker made in his discussion of instrumentation: place instruments of operating value not lower than 42 in. from the floor so that they may be observed and serviced with maximum ease; in designing panel boards, be sure to provide for additional instrumentation.

In discussing control of quality Mr. Warner observed that it is quite impossible to supply a kiln at all times with the exact amount of heat to burn lime properly. Thus, he said, the balance between heat input and heat absorbed must be constantly adjusted. His own company accomplishes this by maintaining a constant heat supply and varying the through-put of charge by adjusting the kiln speed.

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Calcination of Dolomite Fines George E. Connolly, vice-president of the Nichols Engineering & Research Corporation, New York, presented a paper on the calcination of dolomite fines in a Nichols Herreshoff roasting furnace. After describing in some detail the construction and operation of a full-sized roasting furnace, Mr. Connolly told about the performance of pilot plant models used for calcining dolomite fines.

In one such project, undertaken in co-operation with the National Gypsum Co., a five-hearth furnace having an I. D. of 2 ft. 3 in. and a hearth area of 17 sq. ft. was used. The stone fed to the furnace for testing purposes consisted of dolomite fines from National's plant at Luckey, Ohio, the material having a size distribution all below six-mesh and a moisture content ranging from 3 to 6 percent. The problem was to burn the fines to produce a calcine which would have an ignition loss of less than one percent and a slaking rate acceptable to National.

Both objectives were achieved,

D. M. Kerr, Kaiser Aluminum & Chemical Corporation, Salinas, Calif., who told about his company's outstanding success with a recent installation of heavy-media separation equipment.

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In closing, the speaker issued a cordial invitation to members of the Operating Division to visit his company's new testing laboratory at Netcong, N. J.

Screen Heater Don Schulte, sales representative of Cantwell Machinery Company, Columbus, Ohio, told the group about some of the operating advantages which result from the use of the Hanco electric screen heater. Some 25 of these units, Mr. Schulte said, are now used in the limestone industry alone. He stated that experience to date indicates that a screen heater can be used to advantage wherever there is a blinding problem, and that good performance may be expected without regard to the size of the screen opening.

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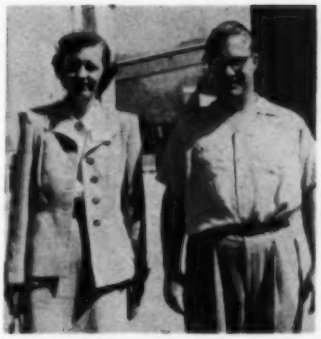

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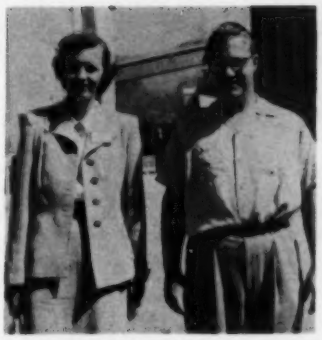

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Members of the panel which discussed contract negotiations and human relations in industry were, left to right: Frank R. Cadman, the Warner Co., Philadelphia, Pa.; Frank R. Dittoe, the Kelley Island Lime & Transport Co., Cleveland, Ohio; and Charles H. Dwyer, National Gypsum Co., Buffalo, N. Y. Mr. Mallery (standing) served as moderator.

can be little hope that contract negotiations can be carried out in an atmosphere of mutual respect and confidence. Thus the whole success of negotiations is in a large measure dependent upon how good a job has been done by supervisory personnel throughout the year.

Good faith of the parties to a labor agreement, according to Mr. Dittoe, is far more important than the legal force of the contract. Although parts of such agreements are legally enforceable, they are really more in the nature of "sets of rules" rather than true contracts. For this reason he believes that the language used should be kept as simple as possible, and that legal terminology be held to the minimum.

Developing his theme further, Mr. Dittoe went on to say that a union representative is a spokesman for a semi-political group, rather than a free agent, and that for this reason it is highly important that management avoid embarrassing him needlessly. There is no easier way to touch off warfare, Mr. Dittoe said, than for management to "ride" a representative or his union. Be fair at all times, he urged, but don't get tagged with the "sucker" label.

R. W. Bowen, Marble Cliff Quarries Company, started off the question-and-answer period by asking Mr. Cadman if his company had obtained a union okay on its work rules. The work rules, Mr. Cadman said, are company rules which are not necessarily agreed to by the union. He also expressed the opinion that work rules should not be placed in contract agreements.

D. M. Kerr, Kaiser Aluminum & Chemical Corporation, asked how seniority clauses should be worded, and how they should be carried out in the event of layoffs. Mr. Dwyer replied that seniority clauses should state that men will not be given jobs unless they are competent to do the work. It is management's prerogative, he went on, to resolve all questions of ability, although some unions endeavor to encroach on this function.

E. D. Williams, H. E. Millard Lime & Stone Company, Annville, Pa., asked the panel to discuss the kinds of disciplinary action which management should strive to retain. Mr. Dittoe pointed out that this problem has been changed considerably by the shortage of manpower. However, he suggested that when an employee persistently breaks the rules, the union be advised that something will have to be done about it unless the man straightens out. This will usually have the desired result; but if it fails, the problem can then be handled through established grievance procedures. At all costs, Mr. Dittoe said, management must avoid sudden, arbitrary disciplinary action, since it almost invariably results in strong opposition from the union.

In discussing the same question, Mr. Cadman stressed the importance of warning men as often and as pointedly as possible before taking disciplinary action. Before discharging a man, he suggested the following sequence of actions: first a verbal warning, then a written warning, and finally several suspensions of increasing duration.

John L. Miller, Shaped Charge Explosive Manufacturers, Inc., Martinsburg, W. Va., who discussed the use of shaped explosive charges in quarrying.

J. G. Wilson, Warner Company, asked if it is advisable to include a so-called "management clause" in contracts. Mr. Dwyer expressed the opinion that such a clause might be desirable if it could be included at nominal cost. Mr. Cadman disagreed with this view on the ground that all powers not specifically covered in a labor contract are probably vested in management. In the long run, he went on, every specific clause that goes into a contract tends to give away certain rights.

K. T. Hammond, Keystone Lime Works, Inc., asked for a discussion of the pros and cons of the union shop question. Several members of the panel expressed the view that the union shop may in the long run be the best deal for management, since it means dealing with a responsible group which controls its members. When management offers some measure of union security in the early stages, there is a good chance that the entire relationship may be on a more reasonable and intelligent basis than would otherwise be the case. In this connection it was brought out that about 85 percent of all workers appear to favor the union shop.

Shaped Charges The concluding presentation was a discussion of the use of shaped charges in quarrying, mining, and construction by John T. Miller, general manager, Shaped Charge Exposive Manufacturers, Inc. Although the phenomenon of the shaped charge was not put to effective use until World War II, Mr. Miller explained that the principle was first noted in 1888.

In discussing the post-war development for industrial usage, Mr. Miller credited PIT AND QUARRY with having published (in 1947) the first comprehensive article on the subject. Although the shaped charge is by no means a cure-all, Mr. Miller said, there are probably places in every quarry and mining operation where it can be used to good advantage for the secondary blasting of oversize.

Dynamite consumption alone, the speaker pointed out, is a poor measure of secondary blasting costs, since the conventional block-holing method calls for the use of compressors, jackhammers, drill steel, and a bulldozer for cleanup. Shaped charges, according to Mr. Miller, offer these advantages: they are in-

sensitive and extremely easy to place; they direct about 80 percent of the explosive energy toward the object, with correspondingly better breakage per unit of explosive; since they do not cause particles of stone to fly, they can be used when necessary in close proximity to equipment.

Mr. Miller displayed samples of the five sizes of shaped charge which his company has developed to date. The two small charges, he said, are known as "trimming units", and are used for reducing oversize pieces of rock ranging from ½ to 3½ tons. The three larger sizes, known as "blasting units", have shattering capacities of 5 to 25 tons each, based on such tough materials as unaltered granite or trap rock. Mr. Miller explained, in answer to a question from the audience, that the mushroom-shaped covers for the charges are made of plastic, which is completely disintegrated when the blast is set off.

Plant Tour An entire morning of the three-day meeting was devoted to a tour of National Gypsum Company's plant at nearby Kimballton. This postwar rotary kiln plant is believed to be one of the most completely instrumented lime plants in the entire world, and the tour was for this reason of more than ordinary interest to most of the operators who made the trip.

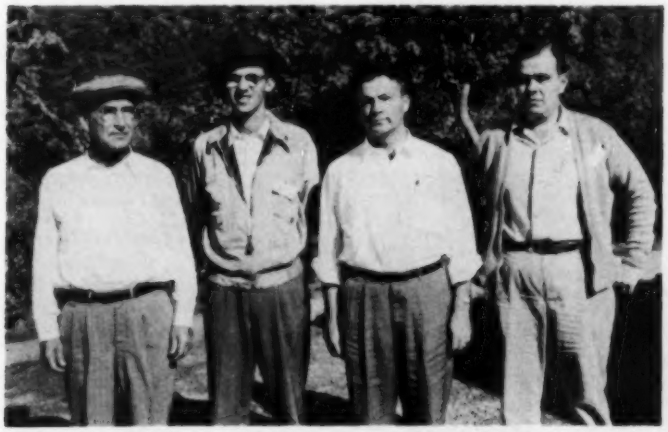
In addition to the conventional electrical controls, the two 8- by 10- by 300-ft. rotary kilns at Kimballton are equipped with controls for primary and secondary air, dampers, coal feed, and kiln draft. There are instruments for indicating and recording kiln speed and the refractory temperature by optical pyrometer;

M. A. Rikard, Southern Cement Co., Birmingham, Ala., who was elected chairman of the Operating Division for the forthcoming year.

for indicating the pounds of primary air per hour and coal mill temperatures; for recording the pounds per hour of secondary air; and for indicating and recording the gas temperatures at the feed end and at the induced draft fan. Temperatures at the 100- and 200-ft. stations in the kilns are obtained by means of thermocouples in the refractory linings. All the instruments and controls for both kilns and appurtenant units are mounted on a single Bailey control panel.

Entertainment Entertainment during the highly successful meeting at Mountain Lake ranged from square dancing to a superlative sleight-of-hand exhibition by Fred Chambers of the National Gypsum Company. All members of the party were also guests at cocktail receptions presented by the St. Regis Paper Company, represented by John F. Gruber, Burton Ford, H. S. Haugen, and Kenneth L. Moore, and by the International Paper Company, represented by Mr. and Mrs. Lee Turner and William D. Peters.

1953 Chairman The final act of the 1952 meeting was to elect a new chairman of the Operating Division to serve for the forthcoming year. The group's unanimous choice was M. A. Rikard, Southern Cement Company, Birmingham, Ala.



Representing the H. E. Millard Lime & Stone Co., Annville, Pa., on the Kimballton tour were, left to right: E. D. Williams, Ernest D. Williams Jr., Casper E. Arndt, and Harlin Kinney.

50-Mile Gulf Freeway Opened Linking Houston and Galveston

Despite the national trend toward toll roads set off by such engineering marvels as the Pennsylvania and New Jersey turnpikes, Texas motorists are getting ready to travel in style the "free" way. On August 2 the $28,643,000 50-mile Gulf Freeway was scheduled to be opened to traffic between Houston and Galveston.

The first contract on the Gulf Freeway was let in 1946 for the first three-mile section within the Houston city limits. This three-mile urban section, plus another six miles completed since then, has already carried 252,000,000 vehicle miles of traffic. Construction costs on the Freeway were split evenly by the state and federal governments, with right of ways being paid for by the City of Houston, Harris County, and Galveston County. The Gulf Freeway is the longest toll-free superhighway built since World War II.

Franklin Limestone Buys Barge Line and Quarries

The barge line and quarries of the Barrett Lines have been purchased by the Franklin Limestone and Quarry Company, Nashville, Tenn., and will be operated under the name of the West Tennessee Limestone Company.

Included in the sale were 21 deck-type barges, 4 hopper barges, two steam boats, one wharf boat, miscellaneous marine equipment, and two quarries, at Neely's Landing, Mo., and Clifton, Ky. The Franklin Limestone and Quarry Company operates six other quarries in Tennessee.

Heidelberg Cement Concern Reports Capacity Production

Portland - Zementwerke Heidelberg, A.G. of Heidelberg, Germany, has reported satisfactory business conditions for the current year. In 1951 the firm was able to maintain its 15 percent share in total German cement production and exports, which last year increased from 10,860,000 tons to about 12,000,000 tons.

It was reported that the company's various subsidies worked at capacity last year, including its brick works and its gypsum and concrete plants. In the latter two industries, shipments were up 60 and 40 percent, respectively.

National Sand & Gravel Association Directors Hold Important Session at Swampscott

By WALTER E. TRAUFFER

One of the two boatloads of conventioneers docking at Gloucester, Mass., after a trip among the lobster traps.

THE semi-annual meeting of the board of directors of the National Sand and Gravel Association was held September 29 to October 1, 1952, at the New Ocean House, Swampscott, Mass. The board of the National Ready Mixed Concrete Association met at the same time, and the final day was devoted to a joint meeting. As usual, the meetings were well attended, with 55 members of both boards present, and most of them brought their wives. Much important business was transacted at these meetings and many decisions were made which affect the Association membership and the entire sand and gravel industry. Every morning and afternoon of the three-day meeting was devoted to business except the afternoon of Tuesday, September 30, when nearly everyone attending went on a most enjoyable bus and boat tour to historic Salem and Gloucester, Mass. There were, of course, also special trips for the ladies. Excellent weather during the entire meeting also contributed to its success.

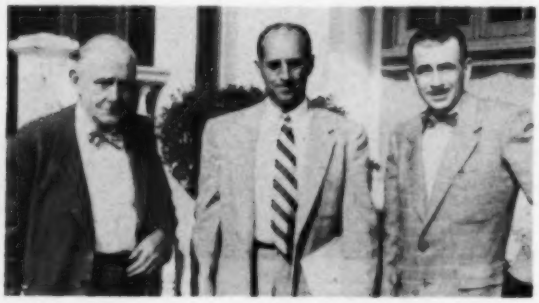
The meeting was opened with a brief address by President Albert R. Shiely (J. L. Shiely Company) in which sound sense and humor were intermingled in his inimitable way. After reviewing recent important developments and previewing some of the "things to come" he turned the meeting over to Vincent P. Ahearn, executive director. It seems that the Association continues to be in excellent condition financially and otherwise and that there have been 18 new active members added since February, for a total of 280. Three new members have also been added to the Manufacturers' Division. As chairman of that division, Richard G. Ketner (General Electric Company) commented briefly on the arrangements for future convention exhibits and entertainment. Manufacturers, he said, still favor a combined show with the crushed stone association. In closing, he said that the division is anxious to help the association and producers in any possible way and said that suggestions would be welcomed.

Convention Plans Considerable time was devoted to a discussion of plans for the coming convention of the Association, which will be held at the Fairmont Hotel, San Francisco, Calif., February 23-26, 1953. It was stated that the directors of both associations and as many producer members as possible will be assigned rooms at the Fairmont, and other members will be located at other good and convenient hotels such as the Mark Hopkins, the Sir Francis Drake, etc. Most of the associate members will be located at the St. Francis Hotel, which is also very good but not quite so convenient. In place of the usual manufacturers' reception a hospitality room will be open at the Fairmont every evening, where both manufacturers and producers and their wives can gather. Arrangements will also be made to have lists of manufacturers' suite locations available as soon as possible. The policy against organized suite entertainment by manufacturers will be continued.

At the joint meeting John Smith of the United States Travel Agency described some of the special arrangements being made in connection with this convention, details of

C. A. Chipley (Fordyce Gravel Co., San Antonio) and J. Rutledge Hill (Gifford-Hill & Co., Dallas).

Morgan R. Butler (Butler Bin Co.); Richard D. Ketner (General Electric Co.); and Ralph Johnson (Simplicity Engineering Co.).



which are already in the hands of members. Briefly, a special train will leave from Chicago *via* the Grand Canyon for San Francisco and on the return trip will go back through Coronado and Las Vegas, making all stopovers. Arrangements have also been made for a plane trip to Hawaii. It was announced that 62 had already signed up for the train and 16 for the Hawaii trip.

Going further into the future, the 1954 convention and exhibit are scheduled for the Conrad Hilton Hotel, Chicago; the 1955 convention will be in Miami. No definite commitments have yet been made for the 1956 convention and exhibit and the date and place for the 1957 convention will be decided in San Francisco. Ray V. Warren (Western Pennsylvania Sand & Gravel Producers Association) invited both associations to meet in Pittsburgh in 1957.

The mid-year directors' meetings of both associations will be held September 28, 29, and 30, 1953, at the Broadmoor Hotel, Colorado Springs, Colo. Norman J. Fredericks (Koenig Coal & Supply Company) invited both boards to meet in 1954 at the Grand Hotel, Mackinac Island, Mich.

General details of the program at the San Francisco Convention were given. The directors' meetings of both associations will be held the afternoon of Sunday, September 22 and on Monday morning pending further information. The actual convention will start at 2:30 p.m., Monday, September 23, with a business session. As Sunday is Washington's birthday, Monday will be a legal holiday and many restaurants, night clubs, etc., are expected to be closed. Tuesday will be devoted to morning and afternoon meetings, and there will be a joint luncheon at which the president of Stanford University will speak. On Wednesday there will be a plant tour by bus which will cross San Francisco Bay on the Dumbarton Bridge to various sand-and-gravel and ready-mixed-concrete plants in the Bay area. The last stop on this tour will be the University of California campus. On Thursday there will be more meetings. On Friday and Saturday, for those interested, there will be a post-convention trip to Carmel and Pebble Beach, where there are several world-famous golf courses. In addition to the above there will be special entertainment for the ladies, including a luncheon on Monday, a bus tour on Wednesday, which will include the Stanford University Campus, and a shopping tour.

Heyward Green (Green Brothers Gravel Co., Franklinton, Iowa); E. K. Davison (J. K. Davison & Bro., Pittsburgh); and Herbert Jahncke (Jahncke Service, New Orleans).

Present indications are that the manufacturers' exhibit at the 1954 convention at the Conrad Hilton Hotel in Chicago will exceed in size even the record show of 1952. The Hilton, it was reported, has considerably enlarged the exhibit space by making the former coffee shop space available for this purpose. It was suggested that the exhibit be kept open one evening during the meeting in order to give the operating personnel of plants in the Chicago area an opportunity to look over the machinery. Representatives of the Manufacturers' Division said they would be glad to co-operate if it is decided to do this.

Percentage Depletion The subject of percentage depletion is still very much alive and was given considerable attention at this meeting. J. Rutledge Hill (Gifford Hill & Company) at the opening session gave a brief review of the history of percentage depletion as it affects the sand-and-gravel industry, up to the recent fiscal year amendment. He emphasized that the industry must continue to keep congressmen and others sold on percentage depletion as no more sand and gravel is being made by nature, and producers are working themselves out of business every day they operate. Mr. Hill also pointed out that many producers are not taking advantage of percentage depletion benefits, that in fact at the time percentage depletion became available, some producers were not even aware of the fact that cost depletion could be taken.

At the percentage depletion session on Tuesday morning it was announced that tentative regulations were expected to be issued within a few weeks. These will be published in the *Federal Register*, after which there will be a 30-day limit for appeal or protest. General opinion seemed to be that producers should take all the benefits they can reasonably justify until rulings are made as it is always much easier to revise downward than upward.

Regarding the cut-off point in an operation, most felt that this should be when the material is loaded in cars for shipment or is ready for such shipment. It seems that each producer will have to work out some details of his cut-off point with the local agent, but that it is wise to follow in general the same practices as the majority of other producers in the area. The best policy seems to be to treat percentage depletion like depreciation: to get the highest possible rate and then adjust it as conditions and developments require.

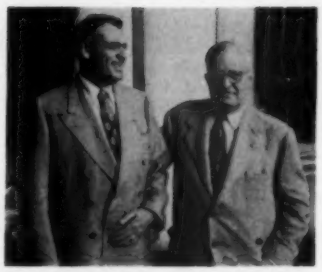
Engineering Directors' Report Stanton Walker, engineering director of both associations, gave separate reports before each group on individual problems and another at the joint meeting on problems affecting or of interest to both industries. Aggregate specifications, he said, had been making many existing deposits unusable, but this problem is now becoming less serious as specifications are becoming more reasonable and more generally applicable. The Corps of Engineers is bringing out a new set of specifications soon which will be more basic than the last and in which thermal compatibility is not even mentioned. These specifications relate to a large extent to problems which exist only in mass construction and are of little interest to most producers but they are being adopted by more and more highway departments and other specification writing bodies.

According to Mr. Walker, intensive studies are being made on the use of gravel in bituminous mixes. Different types of mixes, he said, require different shapes and sizes of materials. Bituminous concrete requires angularity so that the interlocking particles will give it strength, whereas in sheet asphalt and surface mixes best results are obtained with a less angular material. Highway departments, he said, must be sold on the fact that sand and gravel and crushed gravel can fill the requirements for all the various types of mixes, and a research fellow is devoting all of his time to the study of this important subject.

At the joint meeting Mr. Walker described some of the activities of the joint research laboratory, including tests of crushed sand; heavy-media processing; effect of size of

Left: Joseph A. Bullen (Fountain Sand & Gravel Co., Pueblo, Colo.) and R. E. Weaver (Lincoln Sand & Gravel Co., Lincoln, Ill.).

Right: E. F. Brovelli (Basalt Rock Co., Inc., Napa, Calif.) and F. P. Spratlen Jr. (Ready Mixed Concrete Co., Denver).



aggregate, consistency of concrete, cement content on air and water quantities; bituminous mixture studies including immersion compression testing and different methods of stability testing; flexural strength studies; admixture tests, including fly ash and volcanic ash, fire tests, temperature of curing; comparisons of freezing and thawing testing methods; studies of cylinder molds; reproducibility of air tests; etc. He also told of the vast amount of work he and Mr. Blum are doing in conjunction with various technical and industry bodies such as the A.S.T.M., the Highway Research Board, the American Association of Railways, etc. This work, combined with attendance at many regional meetings and at the growing number of short courses, is taking a large part of staff time.

The present contract with the University of Maryland for the joint research laboratory of the two associations expires on January 1, 1953. This contract was for two years and was self-renewing. The new contract now before the board of regents of the University, said Mr. Walker, is for five years and is self-renewing with a 2-year notice clause.

Executive Secretary's Report In his report before the sand-and-gravel board Vincent P. Ahearn, executive secretary, described the status of the work of the OPS Advisory Committee on Sand and Gravel. After considering various possible alternative courses of action, the board voted to have the Association submit formal application to OPS for suspension and decontrol of sand and gravel price control. According to Mr. Ahearn sand and gravel has again been exempted by the Renegotiation Board.

Mr. Ahearn said that the Association's 4-year-old cost accounting manual is no longer adequate and that some better method is needed to help each company accurately to determine its cost. Most producers, he said, do not now know their actual costs and this is a great handicap to them, especially when dealing with the government and unions. A new system for expanding uniform cost accounting procedures in the sand-and-gravel industry will be presented before the San Francisco convention.

In reporting on the car supply situation, Mr. Ahearn said that there will be a shortage of gondola cars for some years to come. Many of the available cars are now being used to handle iron ore arriving by boat from Venezuela and Labrador. Cars are also being used to supplement the ore boats operating on the Great Lakes to make up for the loss in shipments during the steel strike which, incidentally, also seriously held up the railroad car building program.

The subject of cleaning and repairing railroad cars also received some attention. Mr. Ahearn obtained the approval of the board to make a study of the cost of cleaning and repairing cars. The Interstate Commerce Commission, he said, can reject any car not properly unloaded and cleaned out and can charge demurrage until it is put in proper condition. There is, however wide variation in actual practice by different railroads. Some, he said, will pay for the lumber and other materials used in the repairing of cars, others have paid for the labor, and there have been many other schemes arrived at by various producers. However, having this work done or doing it and billing the railroad for the cost is a violation of the law as it is considered to be essentially a rebate by the railroad to a shipper.

View in one of the boats in transit. In the foreground is Eugene Sundt (Albuquerque Gravel Products Co., Albuquerque, N. M.), who was official color photographer.

One of the most serious problems facing the sand-and-gravel industry, said Mr. Ahearn, is the fact that it is a public nuisance and that the public is becoming increasingly aware of this fact. It is essentially dirty and noisy and in recent years has also been pointed out as a major factor in stream pollution. He urged strongly that all producers follow the example of some of the more progressive and far-sighted operators and do everything possible to remove any objectionable features of their operations. More than this, he urged the heads of the various companies to develop better public relations as nearly all are, or soon will be, faced with zoning and land rehabilitation. Each producer, he said, should develop better public relations in his area and the Association should do this nationally. The public, he said, will not tolerate much longer having wastelands near their homes; and if producers do not take steps to reclaim worked-out land, they will find themselves faced with compulsory land rehabilitation statutes.

Federal Legislation Mr. Ahearn told of several bills before Congress which would impose a tax on private carriers for hire, including both water and highway traffic. The combined boards voted in favor of a resolution to oppose any regulation of private carriers by whatever means.

The combined boards agreed that the Association should take no stand on industry-wide bargaining, but that area bargaining should be permitted. Otherwise a union could strike one company in an area, force it to sign an unfair agreement, and then use this agreement to get other producers in the area to sign. A case was cited where in an Illinois county the union struck one company and the other three producers in that county shut down voluntarily. After eight weeks the union agreed to let area-wide bargaining continue.

Robert Mitchell (Consolidated

Rock Products Company) said that the tidelands legislation being proposed is not of interest only to the oil industry as most people think. It also affects all nonmetallic minerals and natural resource industries, not only in coastal areas, as it might eventually affect any submerged deposits, especially sand and gravel. He urged that the Association go on record as favoring legislation to keep control of tidelands in the hands of the states, where it has been for many years. The combined boards of both associations voted in favor of such a resolution.

According to Mr. Ahearn the Walling Ruling is back in litigation; this ruling stated that if any material entered in any way into anything in any way connected with interstate traffic, the production of that material came under the Wage and Hour Law, including its health and safety provisions. The boards voted to oppose such applications if the Association counsel approves this stand.

Industrial Radio Mr. Ahearn described briefly the situation with respect to the use of industrial radio communication by the sand-and-gravel and ready-mixed-concrete industries. The present regulations, he said, are being revised, and it is thought possible that the Federal Communications Commission might revoke some existing licenses in or near large centers of population. The boards voted for the associations to work for the continuation and extension of radio use in these industries.

Group Insurance At the joint meeting two representatives of the John Hancock Life Insurance Company explained the details of the group insurance plan for the ready-mixed-concrete industry and explained how a similar program could be applied to the sand-and-gravel industry. It was also explained that an N.S.G.A. member who is also a member of N.R.M.C.A. can join in the latter's plan for all his operations. Also if the plan is later adopted by N.S.G.A., an N.R.M.C.A. member can extend it to both operations with a minimum of trouble. This plan has many provisions for liberalization, expansion, and other alteration, so that it can be made to fit the needs of any company. There is also a dividend arrangement which may reduce its cost considerably and put an emergency fund in the hands of the employer.

Safety Program It was announced at this meeting that, in addition to the winners in the three classes of the N.S.G.A. Safety Contest, so many other companies (27) had accident-free records that their Certificates of Achievement will be mailed to them instead of being presented at the annual convention as in the past. A record number of 122 plants enrolled in the competition, but this figure can and should be improved as it represents only a fraction of the plants operated by the 280 member companies.

Following are the winners in the three divisions, each of whom will be presented with a *Rock Products* Safety Trophy at the annual convention.

Class A (plants working over 100,000 man-hours)—Van Sciver plant, Warner Company, Tullytown, Pa.; Class B (50,001 to 100,000 man-hours)—Hudson plant, Gifford-Hill & Company, Hearne, Tex.; and Plant 7a, Lyman-Richey Sand & Gravel Corporation, La Platte, Nebr.

Bureau of Mines Releases Data on Vermiculite Tests

Deposits of vermiculite on the Platt ranch near Encampment, Carbon County, Wyo., contain ores that can be upgraded from 50 to 100 percent according to a U. S. Bureau of Mines report.

In 1949 the Bureau conducted an investigation of the deposits by surface trenching, diamond drilling, and sampling. Exactly 81 bulk samples were obtained from the four trenches, and 130 sludge samples from the three drill holes. All samples were analyzed and tested at the Bureau of Mines Intermountain Experiment Station at Salt Lake City, Utah. By crushing and screening the ores, and rejecting the coarse portion, it was found, the finer fraction may be increased in grade 50 to 100 percent over the original ore.

This report, which includes a description and history of the deposits, as well as data on beneficiation tests plus analyses of drill and trench samples, was written by W. A. Young, mining engineer, Bureau of Mines, Salt Lake City, Utah. A free copy of Report of Investigations 4857, *Encampment Vermiculite Deposits, Carbon County, Wyo.*, may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

German Cement Industry Featured in Anniversary Book

One of the most handsome foreign publications on cement to reach our office recently is *Deutscher Zement*, issued by Verein Deutscher Portland und Huttenzementwerke E. V. The volume, artistically bound in gray cloth, marks the 100th anniversary of the German cement industry, which was founded in 1852 by Hermann Bleibtreu.

Beginning with the earliest known masonry structures, the compilers trace the development of (portland) cement to the present. Included also is a section on the important cement concerns of Germany, as well as an account of the rise of associations and societies formed by leaders of the German cement industry. (The earliest such trade association was formed in 1877.)

The second major division of the book deals with the cement manufacturing process, including the development of techniques, materials, processing, research, and related topics. In the final pages the various phases of cement (concrete) construction are covered. Tables, charts, and bibliographical material are included, and the volume is effectively illustrated with strikingly executed drawings.

Bureau of Mines Reports On Illinois Fluorspar Mines

Data on the analyses of four diamond drill-hole cores taken from the Knox and Yingling fluorspar mines in Hardin County, Ill., are contained in a Bureau of Mines report released by the United States Department of the Interior.

Up to June, 1949, the Yingling mine had produced about 8,500 tons of ore containing 60 percent fluorspar. The Knox mine had produced about 15,700 tons of ore containing 60 to 65 percent fluorspar up to the same date, latest operations averaging about 25 tons per day. Both have been worked intermittently.

The Bureau examined the mines in 1949 and studied them again in 1950. The company sank seven diamond drill holes in 1943 and eight more late in 1950. Between February 6 and May 25, 1951, the Bureau drilled four holes in an effort to augment the supply of fluorspar.

Besides several graphs and charts, the report contains a history and description of the property, character of the ore, details of the mine workings, and data on sampling and analyses.

A free copy of Report of Investigation 4856, *Knox and Yingling Fluorite Mines, Hardin County, Ill.*, written by W. L. Burmeister, mining engineer at the Bureau's Eastern Experiment Station, College Park, Md., may be obtained from the Bureau of Mines, Publications Distribution Section, Pittsburgh 13, Pa.

Mexican Cement Industry Shows Consistent Growth

Mexico's 18 cement manufacturing plants (located in widely scattered areas ranging from the northwest coast down to the central part of the country) produced a total of 1,344,531 tons of cement during the first ten months of 1951, according to the official Bureau of Statistics, valued at 148,877,840 pesos ($17,084,797), with most of this amount accounted for by domestic sales.

Cement, in addition to building construction, has been used to build more than 7,000 kilometers of roads, seven new airports, and thousands of kilometers of branch roads in the last five years.

Crushing and Grinding Calculations

By FRED C. BOND

A NEW third theory of comminution has been developed by the author[1, 2] which supplants the old Rittinger and Kick theories. According to the new theory the work input necessary to break rock is essentially the work necessary to deform the rock beyond its critical strain and form crack tips, which split the rock without the application of additional energy. Most of the necessary work input is transformed into heat when the applied stress is released. The work necessary to break a ton of rock is inversely proportional to the square root of the diameter of the product particles.

If W represents the work input in kilowatt-hours per short ton, F is the diameter of the square hole which 80 percent of the feed passes, P is the diameter which 80 percent of the product passes, Rr is the reduction ratio F/P, and Wi is the work index, or the kw.-hr. per short ton required to break from infinite particle size to 80 percent passing 100 microns, then

$$W_i = W\left(\frac{\sqrt{R_r}}{\sqrt{R_r}-1}\right)\left(\sqrt{\frac{P}{100}}\right) \quad (1)$$

and

$$W = W_i\left(\frac{\sqrt{R_r}-1}{\sqrt{R_r}}\right)\left(\sqrt{\frac{100}{P}}\right) \quad (2)$$

Equation (1) is used to find the work index for any crushing or grinding operation where the values of W, F, and P are known, and equation (2) is used to calculate the work input necessary for any feed and product size when the work index Wi is known.

Designating the size 80 percent passes is the most significant method of expressing a screen analysis in one term, and it can be found easily from the plotted size distribution.

Laboratory Tests

The value of the work index Wi can be found from crushing and grinding tests developed in the Allis-Chalmers Processing Machinery Laboratory.[3]

When the impact crushing strength C of the rock in foot-pounds per inch of thickness has been determined (3) and the specific gravity S is known, the work index is found from

$$W_i = 2.59\ C/S \quad (3)$$

When the grindability (3) tests are made at any sieve size in microns, Grp represents the rod mill grindability in net grams of undersize produced per mill revolution, Gbp represents the ball mill grindability, and Wp is the kw.-hr. per net ton of material passing P, in wet grinding, the empirical value of Wp is found as follows:

$$W_p = 23/G_{rp}^{0.625} \quad \text{(For rod mills)} \quad (4)$$

$$W_p = 20/G_{bp}^{.820} \quad \text{(For ball mills)} \quad (5)$$

The work index Wi is calculated from the following equation:

$$W_i = 0.80\ W_p\sqrt{P_i/100} \quad (6)$$

Methods can be developed for finding the work index from any laboratory crushing or grinding test where the feed size, product size, and work input are known.

Crusher Calculations

The power and motor size required for a crushing installation of any capacity for any product size and reduction ratio can be found from the work index by equation (2). The work index can be found from previous crushing experience on the material, from laboratory crushing (or grinding) tests, or from comparison with a similar material of known work index. The work index value remains theoretically constant for all particle sizes, but may actually vary somewhat for different product sizes because of the presence of natural grain sizes in the material; where any differences exist, it is preferable to use the work index for the size nearest that of the machine product.

If the feed is scalped by a screen or a grizzly ahead of the crusher, it is usually sufficiently accurate to disregard the scalping operation and consider that the crusher feed is equivalent in tonnage and size to the feed to the scalping screen; however, a method of making the scalping correction is described in a previous publication.[1]

The capacity of a rock crusher of given size varies only slightly with the hardness and work index of the material, although the power required is directly proportional to the work index. The capacity[4] varies directly with (1) the apparent density in pounds per cubic foot; (2) the width of the crushing chamber (or circumference at the bottom of the gyratory crushers); (3) the open side setting at the bottom of the crushing plates; (4) the length of stroke at the bottom of the crushing plates; (5) revolutions per minute; (6) intermittent feed stoppages; and (7) 1 + .03 (26 — angle of nip in degrees).

A crusher of the proper size can be selected from the calculated power input required and the manufacturer's rated capacity with the above factors specified.

Hammer mills can be selected on the basis of the power input required.

The 80 percent passing size of the feed to large primary crushers is usually overestimated, and an effort should be made to measure the feed size.

Grinding Calculations

The work input W and power required for a grinding installation can be found by equation (2) from the work index when the feed size F and product size P are specified, and the work index can be calculated by equation (1) when W, F, and P are known.

Dry grinding in tumbling mills requires approximately one-third more power than wet grinding, and the power required for the fan on a dry closed circuit mill is much more than that for the rake classifier of a wet closed circuit mill; however, the metal wear per ton in dry grinding is only about one-fifth that of wet grinding.

Closed circuit grinding to a specified product size requires slightly less power than open circuit grinding, and the work index calculated from closed circuit installations should be lower.

The critical speed Nc in r.p.m. is the speed at which a small particle against the lining of a mill, whose internal diameter is D feet, will centrifuge. The critical speed is

$$N_c = 76.63\ /\ \sqrt{D} \quad (7)$$

and mill speeds are commonly expressed as the percent of the critical speed.

Another equation for the average operating speed No, or optimum speed, of ball mills is

[1] Bond, Fred C. The Third Theory of Comminution. *Mining Engineering*, May, 1952.

[2] Bond, Fred C. Bond Theory of Comminution. *Chemical Engineering*, April, 1952.

[3] Bond, Fred C. Standard Grindability Tests Tabulated. Trans AIME, 1949, Vol. 183, p. 312 TP 2180.

[4] Gieskieng, D. H. Jaw Crusher Capacities. Trans. AIME, 1949, Vol. 184, p. 239.

$No = 57 - 40 \log D$ .....(8)

Rod mills commonly operate at about 85 percent of the speed of a ball mill of the same internal diameter.

The ball charge in a ball mill contains about 40 percent of void space and weighs about 290 lb. per cu. ft.; the rod charge in a rod mill contains about 20 percent of void space when the rods touch each other and weighs about 390 lb. per cu. ft. The percent Vp of the mill volume which is occupied by the grinding charge is found by measuring the vertical distance in feet Q from the top of the mill inside liners to the top of the levelled grinding charge, and using the equation

$Vp = 113\text{-}126\ Q/D$ .....(9)

Equation (9) applies where Q is less than 3/4D.

Power input theoretically varies as the mill diameter D to the 2.5 power. In fine grinding at slow speeds the capacity is found to vary as $D^{2.6}$, but in coarse grinding at fast speeds it approaches D^3; thus a large diameter mill is more efficient for coarse grinding. The power input can be calculated from the weight of the grinding charge in tons. When the required power input for a given installation is known from the work index and feed and product sizes, the mill size which contains the proper weight of grinding charge can be selected from the manufacturer's ratings. Some average values are listed at the bottom of the page.

Mill capacity and power required vary directly with the mill speed throughout the usual operating range, but the ball and liner wear increase at higher speeds.

Metal wear is usually reported in pounds per ton ground, but is more accurately expressed in terms of kilowatt-hours per pound of metal.

Some average values when grinding silicious ore of average abrasiveness are listed below; these values include the weight of the worn metal discarded.

Type of Grind	Kw.-hr. Metal
Wet—balls and rods	7
mill lining	30
Dry—balls and rods	35
mill lining	150
Hammer mills	5–10
Fine crushing	30
Coarse crushing	40

The accompanying specimen calculation is an illustration of the use of the work index in designing a hypothetical reduction plant. In an actual application the calculation is complicated by other factors which are omitted here. These factors include: presence of natural grain sizes and different breakage characteristics at different sizes, percent circulating load and classifier or screening efficiency in closed circuit operations, machine speeds and sizes, oversize in feed, pulp dilution, and ball and rod sizes in grinding. Judgment and experience are required in evaluating the effects of these factors, but the new third theory permits more accurate calculations than heretofore.

• Apron feeder and jaw crusher.

Specimen Calculation

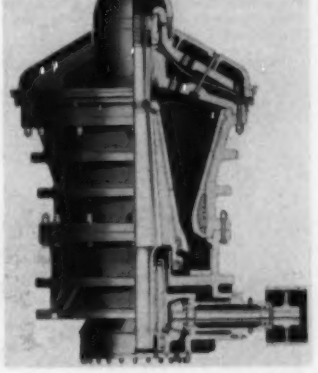
It is desired to crush and to grind wet 1000 short tons per day of silicious rock of specific gravity 2.70 from 80 percent passing 8 in. to 80 percent passing 100-mesh. Laboratory tests gave the following results:

	Equations	Wi =	Work Index
Impact crushing test C = 12.5 ft-lb./in.	(3)	$2.59 \times 12.5/2.70$	12.00
Rod mill grind. at 14-mesh Grp = 15.0 net grams/rev.	(4) (6)	$0.80 \times 4.24\sqrt{1190/100}$	11.70
Ball mill grind. at 100-mesh Gbp = 1.80 net grams/rev.	(5) (6)	$0.80 \times 12.35\sqrt{149/100}$	12.07

Primary crushing: 7 hours/day, 142.9 t.p.h., Wi = 12.00
Feed F = 8 in. = 203200 microns,
Product P = 2½ in. = 63,500 microns, Rr = F/P = 3.20,
$\sqrt{Rr} = 1.79$
From Eq. (2): W = 12.00 (.79/1.79) $\sqrt{100/63{,}500} = 0.21$ kw.-hr./ton
142.9 × 0.21 × 1.34 = 40.2 hp. required
Select 20 in. gyratory crusher at 2½ in. open side setting, non-choking concaves. Use 75 hp. motor for possible overloads.
Estimated metal wear = 0.21/40 = .00525 lb./ton.

Secondary crushing: 7 hour/day, 142.9 t.p.h., Wi = 12.00
Feed F = 2½ in. = 63,500 microns,
Product P = ¾ in. = 19,050 microns, Rr = F/P = 3.33,
$\sqrt{Rr} = 1.825$
From Eq. (2): W = 12.00 (.825/1.825) $\sqrt{100/19{,}050} = .393$ kw.-hr./ton
142.9 × .393 × 1.34 = 75.2 hp. required
Select 651 hydrocone crusher at ⅝ in. close side setting, 1 in. eccentric throw. Use 100 hp.

(*Continued on page 124*)



• Quarter section of gyratory crusher.

Mill Type	At Recommended Speed % No.	At Recommended Speed kw/ton	At No. kw/ton
Rod mill—net overflow	85	5.75	6.77
Ball mill—wet overflow	100	8.30	8.30
Ball mill—wet diaphragm	100	9.60	9.60
Ball mill—dry dia. coarse	100	10.20	10.20
Ball mill—dry dia. fine	86	7.50	8.72

Hydraulic-Powered Tilting Grizzly Speeds Boulder Rejects at Hopper

By HARRY F. UTLEY

another ON THE SPOT report

THE bed of the Salt River yields raw material for processing about 200 t.p.h. of sand and gravel at the plant of the Arizona Sand & Rock Company in Phoenix.

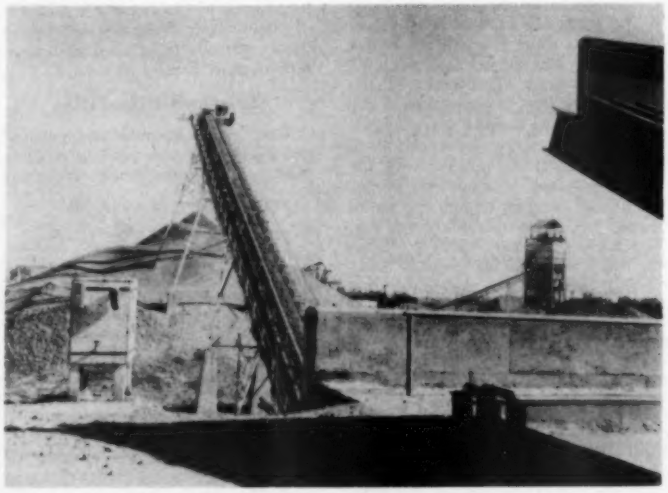
There is a great excess of plus 5-in. cobbles in the pit, however, which the company chooses to waste. Rejection of the unwanted oversize takes place at the hopper where the pit trucks discharge their loads. For a number of years a conventional grizzly was used for this purpose, and several workmen were always required to unblind the openings and sledge material through the bars between truck arrivals.

Superintendent Al Carter recently devised a unique combination drive-over and tilt-up grizzly which has speeded up the operation considerably and reduced labor cost at the same time. It consists of a grizzly deck 25 ft. wide and 18 ft. long, hinged at the reject side. The unit is horizontal while at rest. The end-dump pit trucks drive upon it, discharge their loads, and quickly depart. As soon as a truck drives off, the grizzly begins to tilt until it attains a 55-degree slope, being actuated by two 30-ton hydraulic hoists of the same type used to dump the trucks. The undesired plus 5-in. oversize rolls off to a waste hopper, while the throughs drop to the primary crusher below. The entire operation takes only about 20 seconds, and trucks are never delayed as was formerly the case.

The grizzly is built of rails with the lower webs cut off for mounting in slots provided in the frame. The rails are rendered resistant to batter and abrasion by the application by welding of manganese-steel bars on the faces.

From the hopper the minus 5-in. plus 3-in. rock goes to a Diamond 15- by 36-in. jaw-crusher, the throughs being by-passed directly to the belt by a sloping stationary grizzly. All the material then travels via the 30-in. by 263-ft. belt conveyor for delivery to a surge pile with a live-storage capacity of about 5,500 tons, enough to feed the processing plant for about three days. The Quaker Rubber belt inclines at an angle of 22 degrees for most of its run. Despite the steep rise, there is no tendency toward roll-back, however, due to the slight cohesiveness of the pit-run material, the fines being deposited on the belt as a cushion ahead of the crusher product.

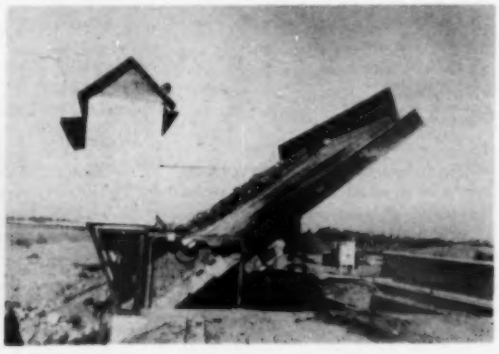
Except for the grizzly-surge pile installation, the plant is essentially unchanged since it was described in PIT AND QUARRY in the July 1946, issue.



• A surge pile with 5,500-ton live-storage capacity is built up by the conveyor from the primary crusher. Although the conveyor is steeply inclined at a 22-degree angle, there is no tendency to roll-back. The corner of the tilting grizzly may be seen at the upper right

• Below: A pit truck of the Arizona Sand and Rock Company, Phoenix, Ariz., discharges material on the tilt-up grizzly after driving across it.

• Below, right: Hydraulic cylinders then tilt the grizzly; the undesired plus 5-in. cobbles slide off to waste; and the throughs drop to the primary crusher.



Know Your Rope Fittings

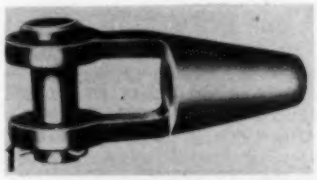
By WALTER C. RICHARDS
Wire Rope Technical Board*

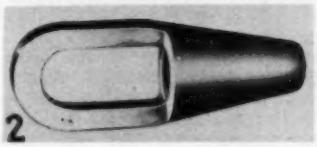
THE subject of end attachments for wire rope is of great importance to many rope users and should be given careful consideration. There are a number of types of rope-end fittings that are in more or less general use, and others that are somewhat limited in their application. But to use any of these end attachments intelligently, it is necessary to know their strength-efficiencies and their advantages and limitations under various operating conditions. A better understanding of these fittings and their features will result in safer and more economical service.

The so-called efficiencies of end fittings (Table I) refer to security of attachment only. They indicate the percentage of useful rope strength that may be expected to be present or available in each case, at the time of installation. When set out in a table, these attachments are usually arranged with the most efficient at the head of the list.

To determine the available working load, the breaking strength of the rope (as listed in the manufacturer's catalog) is to be multiplied by the applicable efficiencies shown in the table before dividing by the selected design factor.

The static load efficiencies shown in Table I, however, do not reflect the effectiveness of these several attachments under all types of live loading in service. For example, Table II is a suggested realignment that reflects additional characteristics. And this order would change with other factors being considered. It should be kept in mind that all of these attachments have given good service in many kinds of applications, but some are better suited than others for certain operating conditions.





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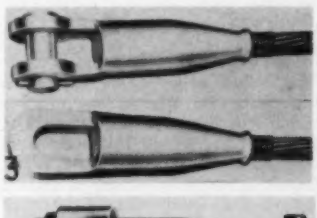
Following is a detailed description of the fittings mentioned in the tables, and others not shown, and a discussion of their relative advantages and disadvantages.

Wire rope sockets may be either of the open (Fig. 1) or closed type (Fig. 2), having a tapered bowl into which the wire rope is secured with zinc. There is a "standard" design for 5-, 6- or 8-strand ropes, and another with an elongated bowl (Fig. 3) designed particularly for high-strength strand. When carefully attached according to the method recommended by wire-rope manufacturers, these sockets will hold the wires securely until the rope breaks.

Where vibration is present in service, however, this rigid attachment acts as a sudden arrestor for the vibration waves and causes progressive failure of the wires close to the socket point. If the socket has been completely filled with zinc, many of the wire fractures will be found on the outside. But in some cases the breaks will occur within the socket bowl and the condition of the rope cannot be accurately judged by inspection. Another disadvantage is that it is seldom convenient to attach these sockets in the field.

The bridge socket (Fig. 4) is a variation of the preceding type and is subject to the same disadvantages. It is a heavy steel casting, somewhat oblong in shape, with a conical opening in the center and cylindrical holes on each side for bolts which secure the socket to its anchorage.

Compression fittings (Fig. 5) are attachments into which the rope is inserted and secured by cold flowing of the surrounding steel under



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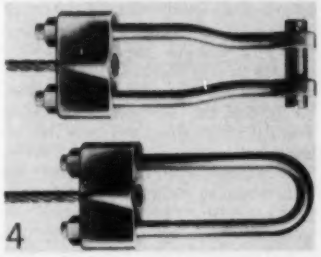

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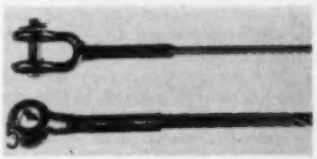

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*The Wire Rope Technical Board is composed of engineers and technical representatives from each of the wire rope manufacturers in the United States. Mr. Richards is a member of the board and is chief engineer of A. Leschen & Sons Rope Co., St. Louis.

TABLE I

Fitting	Efficiency	Fitting	Efficiency
Wire Rope Sockets		Clips	75-80%
spelter (zinc) attachment	100%	Spliced-in Thimbles:	
Compression fittings		⅜ to ⅝ in. inclusive	90-95%
(swaged or pressed)	100%	¾ to 1⅛ in inclusive	85-90%
Compression sleeve attachment		1¼ to 1½ in. inclusive	80-85%
loop with or without thimble	100%	1⅝ to 2 in. inclusive	75-80%
Wedge Sockets	80-90%	2⅛ in. and up	70-75%

TABLE II

Fitting	Strength	Resistance to Vibration and Variable Stress	Ease of Attachment in Field	Compactness of Attachment
Sockets	Excellent	Poor	Fair	Good
Compression Fittings	Excellent	Good	———	Excellent
Wedge Sockets	Fair	Fair	Excellent	Good
Thimble Splice	Fair	Good	Fair	Fair
Clips	Fair	Good	Good	Poor

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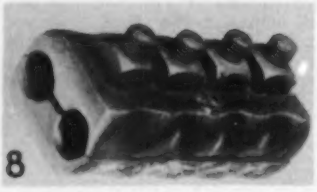

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heavy pressure. Here again, the properly attached fitting will hold securely until the rope breaks. All fittings of this type must be factory attached.

A wedge socket (Fig. 6) is a fitting whose body is tapered in one direction and flat in the other—both lengthwise of the rope. The hollow bowl within this body is of the same shape. The rope is secured in place by passing it around a grooved, wedge-shaped piece of steel and drawing the rope and wedge down into the bowl.

This socket finds wide use, particularly on excavating equipment, as it has the advantage of being readily removable, and may be reattached easily in the field. While this fitting will not develop the full breaking strength of the rope, the ropes on which it is used are generally subject to more or less rapid deterioration. Thus the weakest spot in the assembly would then be somewhere along the rope rather than in or near the socket.

The reason this socket will not develop the full strength of the rope is that at the bend of the rope around the wedge there is a certain binding which will cause a new rope to fail at this point when loaded to capacity. Vibration is also more or less suddenly stopped by this socket, and progressive failure of the wires results. But it is not quite as severe as with the preceding types of fittings, and the wire breaks may extend over a greater distance.

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Many rope ends are attached to their respective anchorages by clips (Fig. 7) or clamps (Fig. 8).

The rope is passed around thimbles, which protect the rope in the loop, and the short end is then clipped back on itself (Fig. 9). A certain number of clips is used at specified intervals, as recommended by the clip manufacturers and concurred in by wire rope manufacturers.

Clips are usually of the single U-bolt and saddle type. Clamps comprise a pair of steel castings or forgings with two grooves to match the diameter of the rope and fastened with three or four bolts. With clips, the rope is subjected to a certain amount of crushing. The same is true of clamps, though they are a little less damaging. There is also, in either case, a tendency for the rope to slip through the fittings if they are not tightened up once or twice after the initial load is placed on the rope.

The advantages of such fittings are ease of application in the field, and the fact that the bad effects of vibration are dissipated gradually rather than suddenly as in the case of zinc-attached sockets. Progressive wire failures caused by vibration are not entirely prevented, however. And in certain ropes subject to very severe vibration, such a condition develops, resulting in broken wires under the first and sometimes the second clip or clamp. In such cases, inspection is difficult.

Rather than employing clips or clamps, the same type of connection may also be made by splicing the end of the rope around a thimble (Fig. 10). The efficiency of the splice itself varies with the diameter of the rope, and in most cases it is more efficient than the clip attachment. The spliced end is the most effective in dissipating vibration. It is easy to inspect the wires for vibration fractures, or damage from any other cause. An objection to

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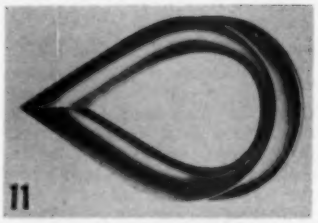

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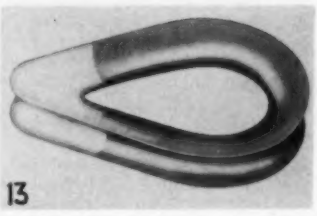

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this attachment is that, in general, it must be made at the factory. In the case of the larger and more important ropes, the thimbles used are special and must be returned to the rope factory for attachment to new ropes.

Thimbles used with clamps, clips and splices are of several patterns. Those most frequently seen are the "standard type" or extra heavy forged thimbles (Fig. 11), solid cast thimbles with pin holes for appropriate anchorage (Fig. 12), and heavy cast thimbles (Fig. 13). These last are similar to the standard type, and are called hawser thimbles.

There are also several fittings of special design recommended by their producers that come under the heading of sockets, clamps, thimbles, etc. They have certain advantages and some of the disadvantages of these respective types. Some of them require special tools for application in the field.

In addition to the conventional compression fitting, there are special metal sleeves for small diameter ropes that can be compressed around the ropes by special hand-operated

(*Continued on page 124*)

Engineer Reviews History of Slag Use & Production in Detroit Area

THE following address was presented by George Thompson, city engineer of Detroit, at the midyear meeting of the National Slag Association on July 10, 1952:

We welcome you to Detroit because it is a good city to come to, and secondly, because of our interest in and use of your product, slag. We have the pleasure of entertaining many visitors from our own and foreign countries, who come here to see our methods of production and construction. The foreigner is usually surprised at our generous use of abundant raw materials, our waste of by-products, and the small number of labor hours that go into our production. To them labor is cheap and material is dear, and waste products must be considered. We find ourselves passing into an era in which we, too, must not only conserve our raw materials, but develop uses for new ones and find economical uses for our waste products.

Slag, as you know, has long been considered a waste product by blast-furnace operation. Reading an old English textbook, published in 1904, I ran across the rather interesting statement that slag was a waste product which plagued the iron masters to such an extent that they had trouble giving it away to anyone who would take it. It is, as you know, a combination of the limestone flux with the earthy materials of iron ore that are floated off the molten metal in a blast furnace and is in effect a man-made igneous rock. Far from being a waste product at the present time, at least in this area, it has become a very valuable by-product of blast furnace operation because its fills many needs in its own right. In manufacturing it is used in the making of cement, roofing coating, and various forms of insulation. In construction it is used for practically all purposes where a hard, durable, clean crushed stone can be used, if properly air-cooled, crushed, and graded. Because of its light weight and the angularity of its broken pieces, it makes an excellent railroad track ballast or an aggregate for either cement or bituminous concrete, and is much used for such purposes in Detroit.

Situated as it is on the Great Lakes, with access to the rich hematite ores of the Mesabi Range of Lake Superior and limestone from the northern part of our Southern Peninsula, and with a combination of rail and water transportation of coal from the southern coal mines, Detroit is well located as a center for the operation of blast furnaces. We have the advantage of being a large consumer of iron and steel products, a great reservoir of skilled labor, and are blessed with an unlimited fresh water supply. Our first furnaces, known as the Hanna furnaces at Zug Island, and now known as the Great Lakes Steel Corporation, started operation about 1916 or 1917, and were shortly followed by the Ford furnaces at their Rouge plant about 1919. Production of slag in the Detroit area is about 1,000,000 tons per year, but the supply is inadequate for the demand.

From 1900 to 1940 Detroit experienced an exceptional growth in area and population, resulting in a demand for quickly constructed passable streets, as virgin farm land was made ready for urban development. Homes built on mud roads were threatened with being marooned in the wet seasons of spring and fall; they were without fire protection, ambulance service, or other necessary vehicular traffic. This created an unprecedented demand for any kind of road-building material to keep vehicles out of the mud. Fortunately, a large tonnage of slag had been stockpiled, and in the years 1925 to 1927 we used about 2,500,000 tons for the surfacing of unpaved streets, of which we have 1,400 miles; there were also 1,260 miles of unpaved alleys. The street and alley picture has gradually changed, so that as of now, we have only 305 miles of unpaved streets and 1,031 miles of unpaved alleys. Ninety percent of the streets and 35 percent of the alleys are now paved. In this paving program slag has played an important part and will continue to do so as we gradually eliminate the unpaved streets and alleys.

Since 1920 Detroit has used slag, to the extent that it was available in this area, as an aggregate in the concrete base of our asphalt-surfaced streets, as an aggregate for the binder course for sheet asphalt, and for both binder course and wearing course for asphaltic concrete. About 1935 slag began to be used as an aggregate for our typical one-course concrete streets. The Department of Public Works of the city uses about 85,000 tons of slag per year for the improvement of our remaining unpaved streets and alleys, and an additional 80,000 tons for the making of binder courses for sheet asphalt, and both binder and wearing courses for asphaltic pavement. We also purchase about 2,000 tons a year for miscellaneous purposes. In addition to slag used by city forces, public works, concrete pavement and sidewalk construction, and asphaltic concrete resurfacing require an average of about 150,000 tons of slag per year.

Detroit's specifications for the construction of buildings and sewers, pavements, sidewalks, and other concrete work permit the use of slag as an aggregate, and our city building code likewise allows it on private construction as a concrete aggregate and for the manufacturing of masonry building units.

In brief, there is an almost unlimited demand for this by-product called slag, which only a few decades ago was pure waste. Like any new construction material, engineers and contractors were skeptical to accept it for many uses where it is now commonly encouraged. With more experience on the part of producers and users of this material, skepticism has given way to confidence. Through the efforts of the National Slag Association, equipped as it is for research and consultation, and the self-policing of its members, your industry is now able to produce and distribute a dependable and standard material. The Portland Cement Association, our D.P.W. specifications, and the city building code all accept it, when properly air-cooled and graded, as an equal of hard stone or gravel. You may look to us as a continuing market for your material, as we shall look to you for its proper production.

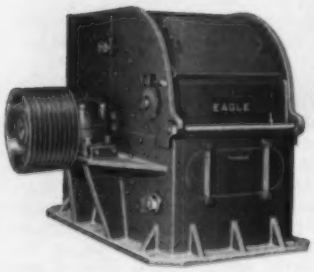
The Monolith Cement Company plant near Tehachapi, Calif., is operating without any interference from earthquake damage, the company reports. No walls or other structures have been destroyed by the recent quakes. Plans are being studied to improve safety measures.

Crushing and Grinding

(*From page 119*)

motor for possible overloads.
Estimated metal wear = 0.393/30 = .0131 lb./ton.
Rod mill grinding: Open circuit, 24 hour/day, 41.6 t.p.h., Wi = 11.70
Feed F = ¾ in. = 19,050 microns,
Product P = 14-mesh = 1190 microns, Rr = F/P = 16.0
$\sqrt{Rr} = 4$
From Eq. (2): W = 11.70 (¾) $\sqrt{100/1190}$ = 2.545 kw.-hr./ton
41.6 × 2.54 × 1.34 = 141.9 hp required
Select 6 ft. × 10 ft. overflow rod mill at 22.6 r.p.m., with 43,000 lb. rods and 150 hp. motor. (Inside dia. 5.5 ft.)
Estimated rod wear = 2.545/7 = .364 lb./ton.
Estimated liner wear = 2.545/30 = .085 lb./ton.
Ball mill grinding: Closed circuit, 24 hour/day, 41.6 t.p.h., Wi = 12.07
Feed F = 14-mesh = 1190 microns,
Product P = 100-mesh = 149 microns, Rr = F/P = 8.0 $\sqrt{Rr}$ = 2.83
From Eq. (2): W = 12.07 (1.83/2.83) $\sqrt{100/149}$ = 6.40 kw.-hr./ton
41.6 × 6.40 × 1.34 = 357 hp. required
Select 9 ft. × 8 ft. overflow ball mill at 19.5 r.p.m., with 63,000 lb. balls and 350 hp. motor. (Inside dia. = 8.5 ft.)
Estimated ball wear = 6.40/7 = .915 lb./ton
Estimated liner wear = 6.40/30 = .213 lb./ton.
Check on overall reduction: Average Wi = 12.00
Total kw.-hr./ton required in four stages = 9.548
Feed F = 8 in. = 203,200 microns,
Product P = 100-mesh = 149 microns, Rr = F/P = 1364,
$\sqrt{Rr} = 37$
From Eq. (2): W = 12 (36/37) $\sqrt{100/149}$ = 9.56 kw.-hr./ton.
Estimated total metal wear = 1.60 lb./ton.

eating into your earnings?



Those who operate Eagle Hammermills and Jaw Crushers are pleased with the speed of replacing wear parts. Interior is quickly accessible. Many parts are reversible or interchangeable for extra service.

And we bend over backwards to speed parts to you —day or night.

It all figures out to less downtime — more profit!

Send for complete specifications!

EAGLE CRUSHER CO., Inc. GALION OHIO·U·S·A

JAW CRUSHERS · IMPACT BREAKERS
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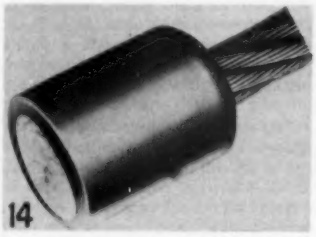
Know Your Rope Fittings

(*From page 122*)

tongs. Many logging ropes have a special ferrule type of fitting (Fig. 14) zincked on the end. This is used in connection with a drop-forged hook, eye or shackle type of fitting. Ferrules may also be fitted with removable wedge inserts which are corrugated to fit the rope.

There are still other compression



types of fittings that screw together, or are hinged, and have on the inside a removable pair of liners which are corrugated to fit the rope. Another type of fitting, which is a combination of shackle and thimble, is the shimble (Fig. 15).

Certain end connections for small ropes are even made with a bent wire or rod which is called a screw anchor. The rope is twisted around this bent rod and back on to itself, forming a lock. A variation of this (referred to as a tailrope hitch) is a forging having an eye or hook

(*Continued on page 135*)

More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. Linatex L-101. A specially processed rubber sheet that is abrasion, corrosion, vibration, and chemicals resistant is the subject of this four-page folder. Application given include pumps, chutes, conveyor belting and pulleys, tanks, fans, ducts, pipes, valves, classifiers, concrete mixers, ball mills, feed scoops and skips. The product is explained and methods of applying are given. Linatex Corporation of America.

2. The Sweco Separator. The eight pages of this bulletin cover the circular separators produced by the company. The principles of operation, construction details, advantages, and other features are presented. Conversion of the units from single to multiple deck operation, changing of screens, and typical applications are also shown. The bulletin lists the various uses for the separators and explains the use of them in wet or dry, fine or coarse, heavy or light duties. Southwestern Engineering Company.

3. For you who fasten into steel or concrete. Remington Stud Driver. Form No. 939. Fastening of studs into steel or concrete by the use of explosive cartridges is covered by this four-page bulletin. The story of the development of the stud driver gun and the types of studs is covered. Typical uses are illustrated and the gun and its accessories are shown. This is designed to introduce the possibilities of a rapid method of driving studs to the reader. Industrial Tool Division, Remington Arms Company.

4. Pyramid Steel Company. Twenty-two pages of text, drawings, tables and illustrations make up this booklet. Shown and described are many types of steels for complete maintenance and repair purposes. Included are non-tempering steel, pneumatic and shock steel, turned-ground and polished shafting steel, heat treated alloy steels, brake die steel, oil hardening die steel, and abrasion resisting steel. Types for rebuilding worn grousers and filler bar applications are also covered. Welding instructions, suggested applications, and heat treatment are given where necessary and the shapes and size available are indicated. A table of hardness conversion numbers is included. Pyramid Steel Company.

5. Carrier Natural-Frequency Conveyors. A line of vibrating conveyors is covered in this 12-page bulletin. Several pages are devoted to an explanation of the principle of "natural frequency" and its adaptation to the conveyors. Other pages illustrate open and closed styles of conveyors, spiral elevating types, and special screening and dewatering dual-purpose styles. Illustrations are plentifully used to supplement the brief text. Carrier Conveyor Corporation.

6. Bailey Instruments and Controls for Process Industries. Bulletin 17-D. The instruments and controls in this eight-page bulletin are grouped into process controllers; control components such as relays, valves and drives; typical systems; measuring components for temperature, pressure, flow, level, smoke density, and gas analyzers; and instrument combinations. Air and mechanically operated instruments and controls are shown and described. Bailey Meter Company.

7. Wire Rope Handbook. R-51. Users of wire rope will find this 64-page pocket-size booklet crammed with information on wire rope. The contents include descriptions, diagrams, and illustrations of wire rope types and constructions, and gives helpful information on lubricants, working loads, safety factors and specifications. Accessory items—clips, thimbles, hooks, and lubricants are listed. A. Leschen & Sons Rope Company.

8. Lubrication and Maintenance Guide for Contractors and Allied Equipment. 4th Edition. The 96 pages of this handy pocket booklet contain information on the lubrication and maintenance of equipment for quarries, crushed stone plants, sand and gravel plants, asphalt plants, ready mixed concrete plants, dredges and many others. Among the types of machines covered are air compressors, air tools, shovels, draglines, conveyors, crushers, and elevators. Engines, gears, transmissions, chassis and crawlers are some of the other items treated in the booklet. Gulf Oil Company.

9. Stressteel Manual. The subject matter of this 60-page booklet covers a method of manufacturing prestressed concrete with a line of stressing bars and accessories. Among the points covered are advantages, applications, design data, materials, specifications and construction procedures. A step-by-step story of the process is shown in pictures from the setting of forms to the stressing of the finished beam. Engineering data is given in tables and in the text. Stressteel Corporation.

10. Hobart Gas Drive Arc Welders. Several sizes of gasoline driven portable welders are shown in the eight pages of this double folder. Stationary and portable mountings are shown and the features pointed out. Typical applications are illustrated by on-the-job photos. The construction features of the generator is shown by a cutaway drawing, and others are shown and described. Hobart Brothers Company.

11. Cleveland Worm Gear Feeder Table Drives. Bulletin No. 140. Illustrations showing several styles of feeder table drives in use fill most of this four-page folder. A cutaway view shows the internal features of one of the types. The text explains the need for the drives and points out the features of the worm gear type. The Cleveland Worm and Gear Company.

12. Allison torqmatic converter. There are three four-page folders in this group of publications. One covers each of the three series of hydraulic torque converters. These differ in size only and the folders are virtually identical except for dimensions and specifications. The principle of torque conversion is explained and illustrated by a cutaway drawing. Applications are suggested by small drawings, and

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charts give the engine torque absorption. Allison Division, General Motors Corporation.

15. Facts on Modern Placement of Concrete Through Air Entrainment. New Enlarged Edition. The forty-four pages of this booklet are filled with questions and answers concerning the air entrainment agent manufactured by the company. The questions are divided into five subjects: what it is; what it does for the contractor; what it costs; what it does for the concrete; and how it is used. Photos show the projects on which the material has been used. Autolene Lubricants Company.

14. Flexco HD Belt Fasteners and Rip Plates with Assembled Bottom Plates. Bulletin F-106. This single page bulletin presents the assembled bottom plate feature of the belt fastener. Illustrations tell the story while the text briefly gives ordering information and prices. Flexible Steel Lacing Company.

13. Stoody Hard-Facing Guidebook. Revised Edition. This booklet covers the rebuilding and hardfacing of all types of heavy equipment used in earth-moving, mining, cement and allied industries. The materials used and the methods of application are given. Stoody Company.

16. Edmont Industrial Job-Fitted Work Gloves. The sixteen pages of this bulletin illustrate various types of work gloves. Use of color presents the gloves in a lifelike manner. Styles of hand and wrist as well as the different kinds of coatings are covered. Case histories are given at the bottom of each page, and specifications are listed for each type made. A table gives recommendations for many operating conditions, and two pages show the company's laboratory and some of the testing equipment. Edmont Manufacturing Company.

17. Crane Signals, Safe Loads - Slings. Safety is the keynote of this 11 by 14 in. wall card. One side shows the standard hand signals for crane operation and some safety suggestions on slings. The cartoon type drawings bring out the instructions graphically. The other side of the card contains tables showing the safe loads for 8-part and single-part slings in all the standard sizes and hitches. Macwhyte Company.

18. CP Portable Compressors. Bulletin 758-7. Air compressors from 60 to 600 cu. ft. capacity are covered in the twenty pages of this bulletin. Gasoline and diesel models are covered, and mounted and unmounted styles. Features of the line are shown on drawings and in cutaway views. The text explains the various points of the line. Each model is shown in one or more styles of mountings and specifications are tabulated. Two pages show the standard accessories for use with the compressors. Chicago Pneumatic Tool Company.

19. Blok-Mesh. This mailing piece covers a mesh reinforcing of high tensile steel for use in masonry construction particularly where concrete block is used. The piece is designed to serve as a general introduction to the material and does not attempt to give detailed information on use, etc. The Carter-Waters Corporation.

20. A Few Facts About Humidification. This folder covers the subject of humidification in a general way. In addition several types of humidifiers are shown and described. Abbeon Supply Company.

21. Heavy-Duty Screens for the Mining Industry. Bulletin 07B7868. A complete line of vibrating screens for mining and similar industries is contained in this eight-page bulletin. Screens for primary scalping of ordinary or sticky materials, secondary scalping screens, wet or dry sizing screens and heavy media separation screens are covered. Other types of screens are mentioned. Allis-Chalmers.

22. Day "AC" Dust Filters. Bulletin No. 528. Felt-tube dust filters with reverse air jet cleaning are the subject of this 16-page bulletin. The bulletin covers operating features, typical installations, company facilities, and many other points. Charts give capacities, dimensions and similar data. The Day Company.

23. Erickson, the Workhorse of Lift Trucks. The eight pages of this bulletin illustrate and describe a line of lift trucks for medium and heavy applications. Lifting heights range from 9 to 14 ft. and loads from 2 to 8 tons. In addition to presenting information on the various models of lift trucks the bulletin also shows scoops, cranes hooks, and other attachments for use with the trucks.

24. Products of American Hoist and Derrick Company. Catalog No. GC-2. The 32 pages of this bulletin cover the complete line of products of the company. Among the items covered are revolving cranes; locomotive cranes, crawler cranes; truck cranes; steel derricks; car pullers; elevators; wire rope clips; hoists; winches; and blocks and sheaves. Illustrations are used to show applications. American Hoist and Derrick Company.

25. One Coat Covers, Agraseal Brush Coat. Pictures compose virtually all of this folder. Typical homes and buildings of concrete masonry that have been sealed with the material are shown. Brief facts are presented about the material and application directions are given Tamms Industries.

26. Dings Non-Electric Perma-Plate Magnets. Catalog No. C-1205-A. Installation pictures, types of separators, and specifications make up the eight pages of this bulletin. Types for special purposes are shown as well as standard ones for the regular uses. Sketches show suggested locations. The text explains the features of the magnets and suggests applications. Dings Magnetic Separator Company.

27. "The Eyes of the Bin" Bin-Dicator. Form BD-5. Diagrams for installing the various models of bin level indicators make up a large portion of this 20-page bulletin. The text explains the features and uses of the different models. A page of installation photos covers some of the diverse commodities that can be controlled by the indicators. The Bin-Dicator Company.

28. Goodman Shaker Conveyors. Bulletin IMD-498. The four pages of this folder are filled with photos of installations showing the application of the metal trough shaker conveyors. Three models of drive units are shown and standard sections and angle sections are illustrated. The text explains the action of the conveyor and lists the power available such as electric or air motors. Other features are brought out by illustrations and text. Goodman Manufacturing Company.

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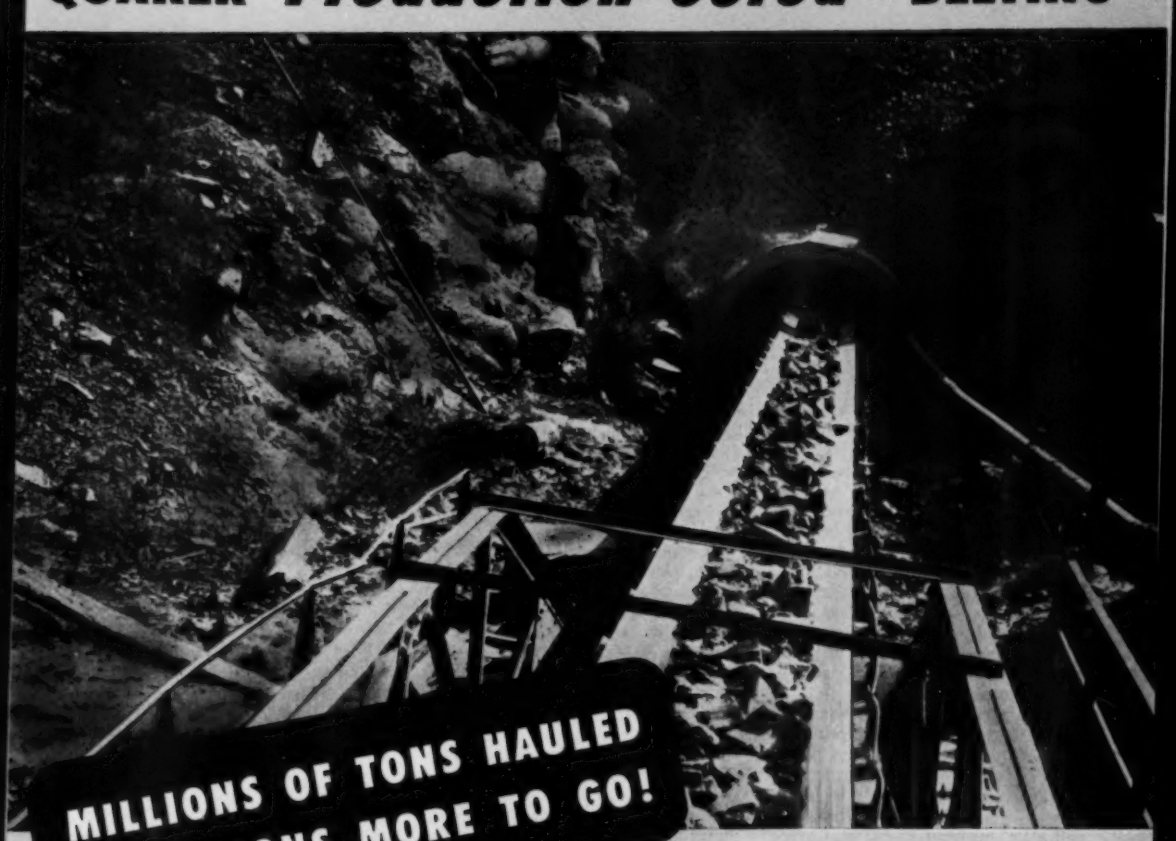

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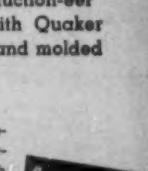

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Killbuck Sand & Gravel Facilities Expanded to 150-t.p.h. Capacity

By WALTER E. TRAUFFER

THE Killbuck Sand & Gravel Company, with a plant at Brink Haven, Ohio, is a pioneer producer which has kept in step with progress. The company was founded in 1913 and started operations at Killbuck, Ohio, 15 miles east of the present location, from which it derived its name. The deposit at Killbuck was nearing exhaustion, and in 1936 this plant was shut down as a new 80 t.p.h. Brink Haven plant went into operation. This plant then operated with little change until the summer of 1951, when an expansion and improvement program was begun. This was completed in February, 1952, increasing the capacity of the plant to 150 t.p.h. C. W. Purdy is president of the company, W. W. Purdy is vice-president, and Robert Purdy is secretary-treasurer and manager. A. W. Hern is plant superintendent, and Sidney Purdy is office manager.

The glacial deposit is known to be from 100 to 160 ft. in depth and up to 80 ft. is above ground water level. The overburden varies from 2 to 12 ft. in depth and this is removed by a Caterpillar D-8 tractor and a LeTourneau 15-cu. yd. Carryall scraper. The original property consists of 77 acres of gravel-bearing land, and 160 acres has since been purchased which is partly gravel.

The gravel in this deposit varies in quality and gradation, so it is worked selectively. A gasoline locomotive and cars originally used were replaced in 1948 by rubber-tired equipment. A 1¼-cu. yd. Bay City 65 shovel with a Cummins diesel engine loads from the bank into a 13-cu. yd. Euclid bottom-dump tractor-trailer which is also Cummins diesel-powered. The haul from the pit to the plant varies to 3,000 ft., and this equipment keeps the plant operating at capacity.

The material is dumped into the 60-ton plant hopper through a 9-in. rail grizzly on which very little is retained. A Simplicity Systems apron feeder discharges the material on a 30-in. by 90-ft. Barber-Greene inclined belt conveyor. This in turn feeds it to a Barber-Greene Ebersol scalper-crusher with a shaking mechanism having a 2½-in. top screen and a 1½-in. bottom grizzly. The gravel retained on both decks is discharged into the Ebersol 2-stage jaw crusher which reduces to 1½-in. minus in its second stage.

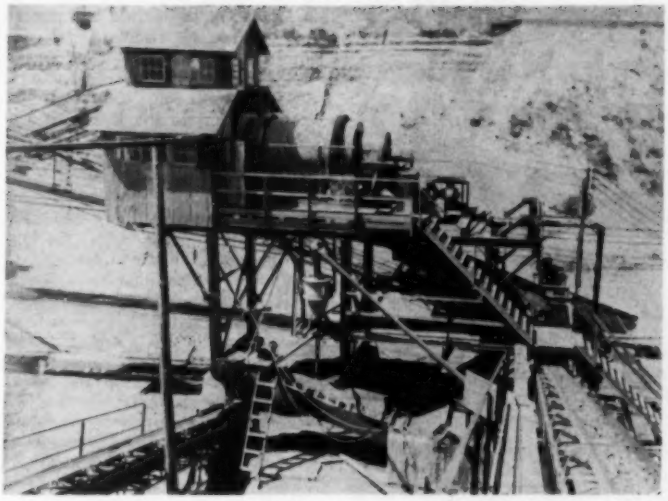
The material through these two decks and the 1½-in. crushed gravel are carried on a 24-in. by 80-ft. inclined belt conveyor to a Telsmith 72-in. by 10½-ft. rotary scrubber. This has a 2½-ft. long screen section on its discharge end with ¼-in. openings. The washed gravel passing over the screen section is discharged into a Stedman 30-in. single-stage disintegrator. The material next goes to a 4- by 12-ft. 2-deck Tyler Ty-Rock screen which is equipped with two repulping troughs. High-pressure water sprays at each trough give excellent washing action without the usual excessive wear on screen cloth at the point of water impact.

Usually this screen is equipped with ¼-, 5/16-, and ⅜-in. wire cloth on the top deck and three sections of No. 4 cloth on the bottom deck. Three sizes are made at one time, two gravels and sand. Ohio No. 3 and 4 gravels are made on the top deck and numbers 6 and 9 on the bottom deck. By changing the discharge spouts for blending, numbers 34 and 46 can also be made.

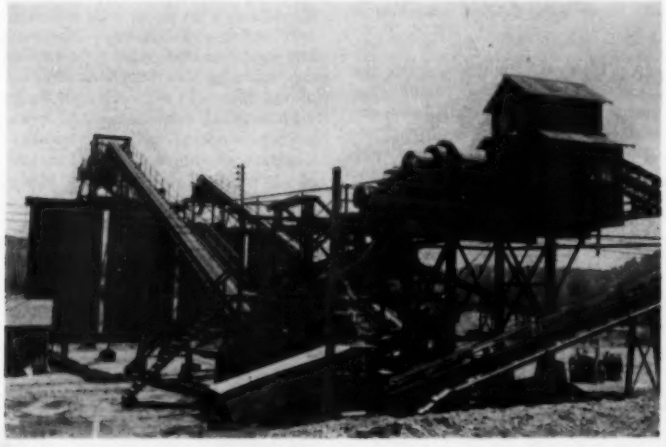
Numbers 6 and 9 are discharged

The combination grizzly-crusher which does the primary reduction of the gravel.

View of the Killbuck Sand and Gravel Company, Killbuck, Ohio, showing some of the deposit and most of the plant. At the left are the scalper crusher and truck-loading bins. At the right, the rotary scrubber, soft stone eliminator, disintegrator, washing screen, reduction crusher, sand screw, and separator.



This view shows the rotary scrubber, the disintegrator, and the repulping screen. In the foreground are the settling tank, the screw washer, and the cone separator.



Above: The coarse gravel conveyor to the truck loading bin is at the right. In the background are conveyors which carry fine gravel and sand to the silos for loading.

Below: The single-stage disintegrator which eliminates any soft material in the gravel.

Below: The 4- by 12-ft. sizing screen, which is equipped with two repulping troughs at the sprays.

on a short belt conveyor and bypass the reduction crusher to another inclined conveyor to a 3- by 6-ft. Deister Machine Company 2-deck screen. This has 3/16-in. cloth on the top and ⅛-in. on the bottom deck and separates the No. 6 and 9 gravels, which are discharged into a 120-ton 2-compartment steel bin for truck loading. A Symons 22-in. cone reduction crusher is used when it is desired to further reduce 1½-in. gravel.

The ⅜- to 1-in. and ½-in. gravel off the top deck (numbers 3 and 4) are carried on a 24-in. by 162-ft. Barber-Greene belt conveyor to a 4- by 12-ft. 2-deck Ty-Rock screen also equipped with washing troughs and sprays. This screen has ½-, ¾-, and 1-in. wire cloth on the top deck, and the bottom deck has one section of 3/16-in. and two sections of ¼-in. cloth. This screen makes No. 3 gravel on the top deck and No. 4 on the bottom. Also by diverting No. 6 gravel on the conveyor to this screen numbers, 34 and 46 can also be made. These sizes are discharged into two 20-ft. dia. by 40-ft. high silos which have a live reclaiming capacity of 250 tons each. Cars and trucks are loaded from these bins through side gates and chutes.

The sand passing through the screen section of the scrubber is delivered to the second deck of a Ty-Rock screen which removes the plus-¼-in., the sand and water going to a 24-in. twin screw Telsmith screw washer or classifier. The overflow goes to the first of two 700-gal. capacity compartments of a settling tank, from which a 4-in. Kansas City "Lightning" pump feeds the collected sand to a 25-in. Georgia-Cottrell Whirlcone separator. From this the sand is discharged into the screw. The overflow water of the Whirl-

(*Continued on page* 144)

ManganeseOreConcentratingPlant Nearing Completion In Nevada

• The kiln and cooler arrangement (cooler at left) for nodulizing flotation concentrate of manganese slimes at Henderson, Nev.

THE first of the new manganese ore concentrating plants which are specially designed to process low-grade United States ores is now beginning operations at Manganese Inc., Henderson, Nev. The plant will process more than 1,200 long tons daily of low-grade manganese ore, assaying from 18 per cent to 25 percent, from the Three Kids Mines nearby, said to be the largest developed deposit of manganese ores in the United States.

A vital element in the manufacture of steel, manganese was formerly obtained from Russia and other "Iron Curtain" countries. Since the United States Government has placed a freeze order on Russian imports, the U. S. stockpile of manganese has been dangerously near depletion. The entire output of the Manganese Inc. plant will be acquired by the General Administration Services of the United States for stockpiling and allocation to steelmakers for current production.

The Nevada deposits of manganese ores have been known for some time, but have not been intensively exploited because of their relatively low concentration of manganese and difficulty of concentration. According to Herbert V. Hughes, manager, Industrial Division, Southwestern Engineering Company, the concentrating process used by Manganese Inc. is an exclusive development of Robert Lord, chief metallurgist, Southwestern Engineering Co. The Lord process produces a flotation concentrate of slime ores which is then nodulized in a rotary kiln to produce a plus 48 percent Mn nodule; it was developed after two years of research.

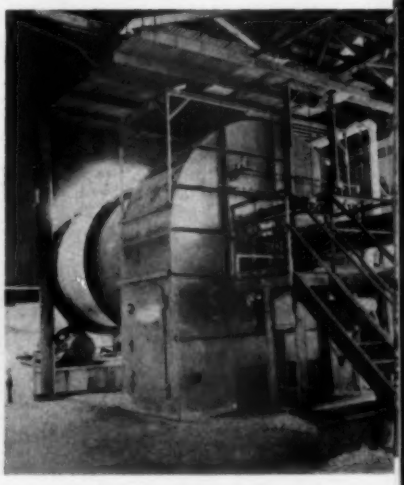
The rotary kiln is the largest of its kind to be engineered and manufactured on the Pacific Coast, according to Robert S. Burns, president and general manager of Standard Steel Corporation, Los Angeles, manufacturers of the kiln. (Southwestern Engineering Co. acted as engineers and procurement agents for Manganese Inc.) The kiln is 10 ft. in diameter, 150 ft. long, with an 11½- by 20-ft. hot zone. Mounted on a 7/16-in.-per-ft. slope, the kiln will receive the flotation concentrate of the manganese dioxide ore, which has been dried and preheated to 900 deg. F., and will nodulize it at temperatures near 2,000 deg. F. The kiln is of all-welded construction, fired with Bunker C oil and brick-lined its entire length.

An interesting aspect of the rotary kiln is an 11½-ft. diameter enlarged portion near the discharge end. Its purpose is to permit better control of accumulations at the discharge section, so that boring bar effectiveness is increased. The boring bar is 20 in. in diameter, 42 ft. long, fabricated from steel plate, with hollowed interior for water cooling. The boring bar has a knife edge for scraping the accumulation from the interior of the kiln. It is inserted at 3- to 4-hr. intervals while the kiln is rotating at its normal speed of approximately one r.p.m. Another function of the enlarged portion of the kiln is to minimize build-up of ore accumulations by giving the nodulized manganese dioxide a greater peripheral speed at a point just beyond the reach of the boring bar.

After leaving the kiln, the manganese dioxide nodules enter a rotary cooler also manufactured by Stand-

(*Continued on page* 144)

• Left: The drive arrangement at the second tire on the new kiln shows the girth gear, reducer, 75-hp. motor, and stand-by gasoline engine.



• Right: The firing end of the new kiln, showing the burner arrangement and hood. The hot-zone temperatures are in the 2,000-2,200 deg. range.

California Plant Produces Zeolite At Rate of 20,000,000 Lb. Annually

another ON THE SPOT report

ZEOLITE is the name applied to a group of nonmetallic minerals identified as hydrous aluminum silicates, which contain easily-exchangeable sodium ions. The principal use is in water softening. Two

By HARRY F. UTLEY

types are employed commercially, a natural product derived from marl or greensand (glauconite), and a synthetic zeolite which has proved quite superior to the natural product and which is in greatest use.

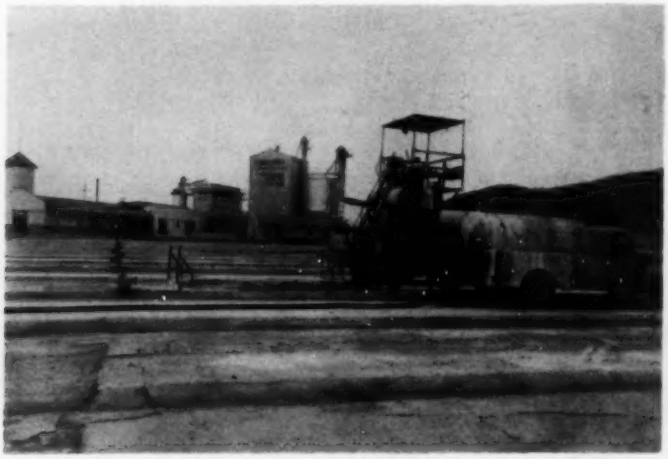
The Culligan Zeolite Company operates what is said to be the largest synthetic zeolite plant in the world near San Bernardino, Calif. It uses solar evaporation to dry the product from its initial gel form. Processing involves screening, crushing, washing, and drying the material. The 34 acres of concrete-paved and concrete-curbed drying beds enable the company to produce about 20,000,000 lb. of zeolite annually, which it ships to its Northbrook, Ill., headquarters, and to its licensed local dealers serving 3,000 communities from coast to coast.

The company was founded by E. J. Culligan, present chairman of the board, one of the pioneers in the water-conditioning field, who developed the process a quarter-century or so ago. Since solar evaporation is the heart of the process, pilot operations were first set up at such likely spots as Phoenix and Yuma, Ariz. Later the present site near San Bernardino was acquired, and the facilities were erected in 1942. Here conditions are ideal for solar dehydration. A high percentage of possible sunshine, plus a constant movement of warm, Mojave Desert air through Cajon Pass make this possible. There is also a dependable water supply, and the terrain drops steadily away, permitting automatic washing and drainage by gravity without the expense of mechanical pumping.

• Scene at the Culligan Zeolite Company's plant near San Bernardino, Calif., showing raw material storage tanks and (between) the three "cookers" where bauxite and caustic soda are reacted to produce sodium aluminate.

Minerals employed in the process are purchased and available close by, with the exception of bauxite, which comes by rail from Arkansas. In the process, sodium aluminate and sodium silicate are mixed to produce the zeolite gel. Bauxite and caustic soda are first reacted in gas-fired "cookers" to produce the sodium aluminate. The sodium silicate is brought from Los Angeles by tank trucks. The two ingredients are hauled to the drying beds in a two-compartment transfer truck and combined immediately before pouring to avoid premature jelling. A truck-mounted pouring rig is employed to proportion, dilute, mix, and spread the solution. Bed sections about 4-in. thick and 20-ft. square are poured at one time. This 4-in. thick layer of gel ultimately dries out to a thickness of about 1 in. before it is harvested by a mechanical sweeper and a Scoopmobile for processing in the adjoining plant. Depending upon the weather, from 2 to 5 weeks of drying time is required. The beds are not in use during December and January because of adverse drying conditions; but sufficient material is held in storage from the yield during the preceding 10 months to supply the plant.

The processing plant flowsheet begins with the weighing of the harvested material, now gray-white and brittle. It is then elevated to storage. From the storage bins a re-



• This view, taken on the 34-acre concrete-paved drying beds, shows the 2-compartment tank truck and the spreading rig in the foreground. The processing plant is in the distance.

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ciprocating feeder sends the material via a belt-conveyor to a bucket elevator which lifts it to the top of the mill building. Here the raw zeolite can be fed to either or both of a pair of Rotex enclosed 2-deck screens. Upper decks reject plus No. 8 material, which drops to a Sprout-Waldron double 2-roll crusher, set to reduce the material to minus No. 8 mesh, with a minimum of minus No. 50 fines. This is accomplished by the method of roll corrugation employed, one roll in each set having horizontal corrugations turning against the other roll which is ribbed vertically. Products of the rolls moves along in open circuit to a third Rotex screen of similar size and mesh characteristics as the two primary units. Plus No. 8 material is recycled and minus No. 50 material is wasted. Particle-size range desired for finished zeolite is between No. 8 and No. 50 mesh.

All the screens operate dry, the material of the desired grain size from the screens passing to a Wilfley concentrating table where water is introduced. The table rejects the "heavies", sand, etc., while middlings are returned to the table feed in closed circuit. The cleaned and sized zeolite is then flumed to any of four up-flow washing-and-settling tanks where any soluble salts are washed away in the overflow. After a short settling period the material is pumped by Worthington centrifugal pumps to retaining tanks in the packing building.

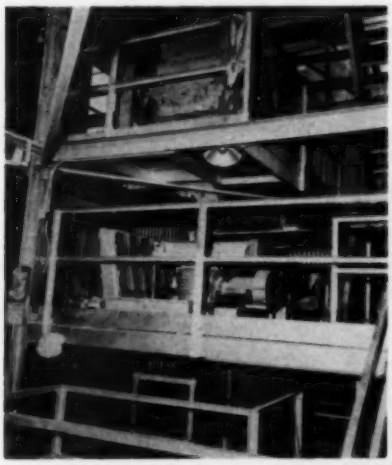
From the retaining tanks the still wet zeolite was formerly withdrawn and shipped in a damp condition as the finished product. Small amounts are still shipped in this manner, but rising freight rates were primarily the reason for the company's decision to add a drying step to the process in 1950. The principal unit here is a Link-Belt Roto-Louvre rotary dryer fired by either natural gas or oil. This unit is equipped with Brown and Minneapolis-Honeywell instruments to record and control operations. Dryer-feed tanks are Bindicator-equipped and feed is regulated by a variable-speed belt conveyor.

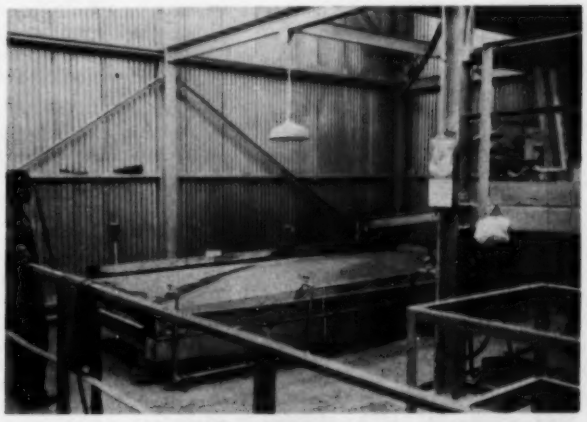
The dried zeolite ultimately reaches the sacking department,

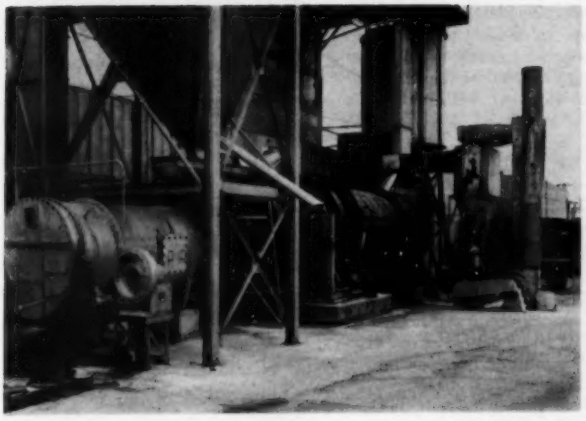
(*Continued on page* 144)

• Below, left: A two-high double-roll crusher on the upper level feeds the product to the enclosed screen immediately below.

• Below, right: After screening to the desired grain size and the addition of water the zeolite is concentrated on this 5- by 10-ft. table. Middlings are returned in closed circuit.







• The 8- by 22-ft. rotary dryer which handles both zeolite and silica gel. The furnace is at the left; the cyclone collectors at the right.

• Filling and sewing the 100-lb. paper-lined burlap bags of zeolite which are carried away by the cleated conveyor shown.

Locking Out Machinery As A Means Of Controlling Severest Hazards

By O. A. LAWRENCE*
Plant Manager
Universal Atlas Cement Company
Buffington, Ind.

The human body is frail, indeed, when compared to the forces exerted by the machinery we operate. For this reason accidents caused by moving machinery carry such a high severity rate in our industry that the need for guarding moving parts has for a good many years been accepted as an absolute necessity in reducing accidents.

This guarding of moving machinery, which we now consider basic to any good safety program, required a great deal of selling by the pioneer safety engineer. To those who fought for the guarding of machinery, full credit must be given for the reduction of severe injuries in industry today. We soon found, however, that the guarding of moving parts alone did not fully eliminate moving machinery accidents. We found that men would reach through guards to feel the tension on a moving V-belt. We found that men would reach behind guards to oil and grease machinery. We found that men would clean pulleys and conveyor rolls while in motion. We found through bitter experience that our guards did not give 100 percent protection from injury, and so we gradually adopted another practice which has been accepted throughout the industry, that of shutting down all moving machinery when repairs or adjustments are necessary.

It does seem that adequate machinery guards along with the practice of shutting down operating units for adjustments and repairs would once and for all end accidents caused by moving machinery. Through sad experience, however, we found that the human element again prevented absolute control of machinery accidents.

Thirty-six accidents last year were reported to the Portland Cement Association which were the direct result of failure to properly lock out machinery until repairs were completed and all workmen were in the clear.

These 36 accidents included 2 deaths, 1 permanent total disability, and 14 permanently crippling injuries. This year to-date the story is very nearly the same; 2 deaths reported from this cause in the first 7 months.

Since this problem of locking out machinery is of such major importance in controlling severest hazards, I would like to relate our experience in dealing with this problem.

Unfortunately, it sometimes takes an injury or a close call to stir us to positive action in this safety work of ours, and we confess that our plant safety lock program, as it exists today, is the result of our being badly scared. An electrician working on a motor just missed being seriously if not fatally injured, when his safety lock was removed from the switch of the motor on which he was working and the switch put into the closed position.

After our scare we were indignant. We had a locking out program. We had furnished employees with safety locks. We had discussed their use in safety meetings. Why, then, should we have narrow escapes such as this? Well, a closer look at our program revealed that several keys were available for each lock permitting easy removal by anyone securing a key. Locks sometimes were left on uncompleted jobs by off-going employees, necessitating removal by other employees, when the job was completed. And we found different departments administering the program differently. Obviously, unless we were content to risk another near-serious accident, we had to tighten up our locking out program.

The more we considered what was necessary to a good locking out program the more we realized that a completely revamped program was necessary at our plant; a program wherein we must set forth certain basic fundamentals about safety locks that all must follow. We must answer such questions as what happens when the worker reaches the end of his turn and the job is not completed. Does he remove his lock or does it remain to protect the equipment? Certainly the equipment must be protected. Yet, what if the job is completed while the employee is at home? Who removes the lock, and how?

How many keys should there be to a lock, etc.? There were many angles

O. A. Lawrence

to consider, and during the discussions preliminary to preparing our rules we had many and varied opinions.

A subcommittee was selected for the purpose of preparing a proposed set of rules for consideration by the plant general safety committee, which must pass on all rules before they can become effective at our plant. This committee reviewed rules for locking out machinery used by other industries. These rules were found to vary among plants, and few of them were considered to be satisfactory in our situation.

The subcommittee first decided that safety locks are designed for the protection of the employee, and therefore the lock must be with him at all times so that it always is available to perform its duty of protecting its holder while he is working on plant equipment. Thus came into being a basic fundamental at the plant concerning safety locks, namely, that the safety lock is a personal tool to protect the employee.

Well now, a repairman working on a piece of equipment goes home or is called to another job and takes along his safety lock. To all intents and purposes, this would indicate to a casual observer that the equipment is ready for operation. Starting equipment in such condition could have serious results; so job number two was to provide a lock program also for protecting the equipment.

Other questions were considered by the subcommittee: Who was to hang the locks? When? Who was to remove them, When?

Effective March 16, 1949, the following rules concerning the use of safety locks were to prevail:

1. "A standard type of lock shall be issued to each individual, who has need for a personal safety lock, as determined by the department head.

*A paper presented at the 1951 National Safety Congress, Cement and Quarry section.

Fig. 1—A switch locked in an off position by a personal safety lock.

2. "The personal safety lock shall be considered to be exclusively for the protection of the individual and shall be placed on the switch in such a manner as to lock the switch in an off position (Fig.1) on any piece of equipment to be worked on. The lock shall be removed only by the holder of the lock.

3. "Whenever an individual leaves the job (that is, assigned to another task, end of turn, etc.), he shall remove his personal safety lock and take it with him.

4. "In the event that an employee is reassigned to another task or reaches the end of the turn before the job is completed, he shall secure from an authorized person in his own department a machinery lock which he shall place on the locked out switch before removing his personal safety lock.

5. "Different colored personal safety locks (Fig.2) shall be issued to the employees of the various departments. This color coding will aid in determining the department working on the equipment.

6. "Machinery locks for the various departments will be of the same color as the personal safety lock and will be further identified by addition of a yellow stripe on the lock. Such locks will be in the possession of an authorized person in each department whose responsibility it will be to dispense machinery locks at the request of the workmen and to remove such locks upon completion of the job.

Fig. 2—Vari-colored safety locks are issued to employees of various departments.

7. "When a group of workmen are engaged on a job the leader of each group will be responsible for placing his personal safety lock on the switch of the equipment being worked on and any individual workman may, as he desires, also attach his personal safety lock. (Fig. 3) The leader shall be responsible for seeing that all employees are in the clear before removing his personal safety lock."

Now we had what we considered a good set of rules governing the use of safety locks at our plant. We concluded that we shouldn't have any more close calls to anyone working on machinery, through failure to lock out the machinery or through promiscuous removal of locks, that is, if the men abide by the rules. There was the bug, "if the men lived up to the rules". We decided that the program could be a success and that the men would live up to the rules if properly trained. The rules were made known to our union officers, they were published on the safety bulletin boards, they were discussed in safety meetings, and a copy of the rules was issued with each lock. In addition, we provided for dealing with the occasional offender who cannot abide by the rules as follows:

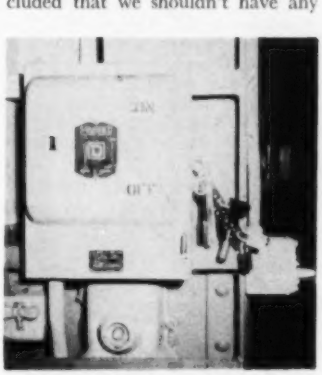


Fig. 3—Several personal safety locks are used on a switch when several groups are working on equipment.

"Management desires to provide to the greatest degree possible a safe working procedure and to that end the following shall prevail:

"Any employee starting or attempting to start a machine while a safety lock is on the switch or who removes a safety lock, other than his own 'personal safety lock' without proper authority from his supervisor, shall be subject to disciplinary action. Such discipline may extend to suspension preliminary to discharge."

I wish to add that to date we have not had to discipline anyone for violation of this rule nor have we had any injury or near-accident through misuse of safety locks since the effective date of these rules.

It is not my intention to imply that our safety lock program works perfectly. We from time to time find a safety lock on the employee's locker. We immediately check the number, find the employee who is the offender, and have him remove the lock and at the same time explain to him again its purpose.

It is also necessary to call in locks from time to time and have them repainted in order to identify the department or to identify the machinery lock. In other words, the program requires constant policing.

We believe it is another step toward absolute control of machinery accidents to see that the safety lock program works.

Know Your Rope Fittings

(*From page* 124)

at one end, and grooved to receive a rope. The rope is passed around this grooved path in the form of a half hitch which holds itself under tension.

It should be emphasized again that all the foregoing attachments

have given good service in many kinds of applications. And, since some are better suited than others for certain operating conditions, intelligently picking the best fitting for the job it is to do will result in safer and more economical service.

Cement production in East Pakistan will be increased to 100,000 tons yearly according to present plans. The factory, which is situated at Chatack near Sylhet, has already boosted production from 24,000 to 60,000 tons yearly. A new rail line is planned for handling shipment of the cement.

THE MODERN BUS & TRUCK

Fuels and Lubricants Part I*

THE bus and truck industry manufactured over a million vehicles in 1941 and each year from 1947 through 1951. Records are not available regarding production 50 years ago; however, in 1904 AMA Records indicate that 700 units were sold. In the peak year of 1951 production was over 200,000 percent above that at the turn of the twentieth century. It is estimated that currently over 9.1 million busses and trucks are registered in the United States for on the highway use. The useful life of this equipment will depend on the care and attention it receives. Also the longer the life span of any unit can be increased without increasing service costs, the greater will be the return or earnings derived from its use.

Preventive maintenance (PM) is not a new idea. The principles as established more than 30 years ago set the pattern for present-day practices. As evidence we quote from an article in *Lubrication* back in March, 1921,[1] when approximately one million trucks and busses were in use, which contained the following remarks ". . . In service where maximum reliability is essential . . . the mechanical equipment is given a careful inspection at definite periods before trouble is expected to develop. These periods are determined by long experience as the shortest time the mechanism may be depended on to operate without danger to service. Inspection is made without waiting for trouble to develop. It is a common sense application of the principle of prevention. A good example of this type of inspection is presented by the routine of a certain well organized motor-bus transportation company, where every vehicle is given an inspection covering fuel, oil, water, etc., each morning; a general overhaul covering lubrication in detail, carbon removal, spark plugs, bearings, valves, etc., after each 2000 miles and a complete disassembly and rebuilding each year which represents approximately 30,000 miles."

Although today more power is obtained from smaller engines and transmitted through smaller transmissions and differentials, improvements in equipment design and fuels and lubricants have increased materially the miles between mechanical adjustments and tear-downs for most bus and truck operators. During the course of the past years there has been an increasingly close harmony between the mechanical designer and the fuels and lubricants developer so that their improvements parallel each other.

Most vehicle operators have learned of the advantages of PM and have set up definite procedures in accordance with their operation to service and maintain their equipment. All, however, have not reached the point of maximum life and utility of their units. During periods of stress and national emergencies when shortages of new equipment existed many individual passenger car owners also were indoctrinated with the principles of PM. They realized that "a stitch in time saves nine" is equally as applicable to automotive equipment. Today many of them are requesting more and more information on how to best service and maintain their cars to obtain top performance for longer periods.

Since the correct fuels and lubricants properly applied are major factors in PM, the purpose of this article is primarily to discuss developments by which these products are being improved so that they may help prolong the usefulness of automotive equipment.

ENGINE FUELS

The engine is usually considered to be the most important component of an automotive vehicle since it supplies the motive power. It is also the most intricate component, it presents the most probelms and it operates more than any of the other vehicle parts. The commercially available engines for bus and truck use are powered by either gasoline or diesel fuel. The liquefied petroleum gas (LPG) powered engine is considered to be in the gasoline category since it operates in the same manner although the fuel is handled differently and the engine may be modified somewhat to obtain the best performance from the use of LPG.

Although many people may contend that there is not much difference between the results obtained from any of these fuels, actually, the most suitable for any one type of operation is not necessarily the best for a fleet operating under different conditions. The selection of type of powering to be used must be made on the basis of a complete analysis which includes many factors. A few items that must be considered are: type of equipment in use and its expected life, overhaul and service facilities available, type of operation, first costs, cost of replacements and parts, availability and costs of fuel and local or area restrictions and regulations. This matter of selection of equipment requires considerable discussion which is far beyond the scope of this article. At present the majority of truck and bus engines are gasoline powered; a very small percentage are using liquified petroleum gases. Diesel fuel powering, although rapidly increasing in use, is still a distant second to gasoline.

MOTOR GASOLINE

Before the automotive engine demand for fuel arose, light petroleum fractions below the kerosene boiling range had little or no utility. By 1910, however, the automotive engine fuel demands exceeded the demand for all other petroleum fractions. This created the need for increasing the yield of gasoline per barrel of crude. The solution was found in the cracking process which converts high molecular weight high boiling hydrocarbons into light fractions suitable as motor gasoline. The thermal cracking operation, the first type of cracking process used, is a process wherein at the same time as lighter hydrocarbons are formed heavier materials are also produced which are not susceptible to further cracking.

Later developments led to catalytic cracking. This accomplishes the same purpose in regard to breaking molecules but the direction of reactions is more carefully controlled through a catalyst or activating agent. As a result a greater yield of motor gasoline is obtained with less loss to heavy and very light molecules. Also, in this process the antiknock properties of the gasoline are enhanced due to the formation of certain types of hydrocarbons. Studies of the various reactions have led to the development of other processes such as polymerization, hydrogenation, alkylation, dehydrogenation, isomerization and cyclization or aromatization. All of these processes either join molecules, rearrange atoms in molecules or add or remove hydrogen atoms in hydrocarbon molecules to obtain the specific hydrocarbon structure desired. As a result of these processes it has been possible to increase the yield of gasoline from petroleum crude economically while

*Reprinted from *Lubrication* by permission of The Texas Company.

[1]*Lubrication of Motor Vehicles — The Effects of Neglect.*

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Table I—Typical Characteristics of Automotive Fuels

Name	Gravity °API	Boiling Point °F.	Vapor Pressure @100°F. p.s.i. abs.	Specific Gravity 60/60°F.	Specific Weight @60°F. lb./gal.	Lower Heating Value		Octane Number	
						B.t.u./lb.	B.t.u./gal.	Research	Motor
Propane	147	—44	184	0.508	4.23	19,670	83,340	100+1.9 ML-TEL	97
Butane	111	31	52	0.584	4.86	19,470	94,670	94	90
Motor gasoline	60	90–420	6–15 (Reid)	0.74	6.16	18,900	116,400	75–95	70–87
Kerosene	42	300–500	Less than 1.0(Reid)	0.82	6.79	18,560	126,200	—	—
Diesel fuel	35	350–650	Less than 1.0(Reid)	0.85	7.08	18,390	130,300	—	—

providing improved motor gasolines for engine fuel.

The modern motor gasoline is considered as containing a mixture of hydrocarbons, this mixture having a boiling range within the extreme limits of about 90 deg. F. to 420 deg. F. as noted in Table I. It is recognized that the values shown in this table may vary depending on their source. Some of the hydrocarbons present may boil considerably below 90 deg. F. but these materials are usually present in relatively small percentages and do not significantly change the nominal boiling range noted. The hydrocarbon molecules present may range from 4 carbon atoms to as high as 12 to 16 carbon atoms.

The stocks used to blend with these fuels as they come from stills or manufacturing units contain constituents that are undesirable in motor fuels and must be removed or treated to render them harmless to the engine parts.

A gasoline engine can be made to run on almost any kind of gasoline provided it can be started and uneven operation is unheeded, but reliability, flexibility, economy and smoothness are prime requirements of satisfactory operation and optimum engine life. These characteristics depend jointly on qualities of the gasoline and the mechanical and operating conditions of the engine. The major characteristics of motor gasoline that govern its quality performance-wise are octane rating and volatility. The octane rating is governed to a great extent by the types of hydrocarbons present and may be improved within limits by the addition of tetraethyl lead. The volatility is controlled by the relative amounts of high and low boiling molecules used in the blend.

Octane Rating Gasoline octane rating should be above that demanded by the engine; marked increases in anti-knock qualities, however, serve no purpose. The practice of increasing spark advance beyond the engine manufacturer's recommendation when the octane rating of motor gasoline is well above the engine demand may easily result in loss of power followed by a rapid loss in economy with further small spark advances. This may be noted from the typical power, economy and full throttle octane requirement curves for various spark advances shown as Fig 1. In addition, operating temperatures are influenced considerably by spark advance.

Too low an octane rating will result in engine "knock" or "ping", under certain conditions of operation, with attendant loss in power, engine overheating and possibly damaged gaskets, pistons and bearings. Typical detonation failures are shown as Fig. 2. If it is not possible to obtain motor gasoline of sufficient octane rating then corrective measures should be applied to the engine such as adjustment of ignition timing (retard) or adjustment of carburetor mixtures (richen).

Pre-ignition It is of interest to note that some engine "knocks" may be of a mechanical nature and the inexperienced listener may attribute them to the fuel. Also, if the engine is mechanically normal, a fuel "knock" may also result from pre-ignition. (Pre-ignition means the initiating of combustion before and by some means other than the properly timed spark at the plug; detonation is the term applied to "knock" caused by a too low octane rating of the fuel.) Pre-ignition is generally caused by localized overheating at some point such as exhaust valve heads, spark plug electrodes, high spots on the piston or cylinder head

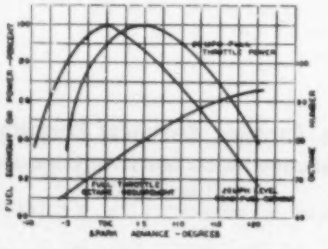
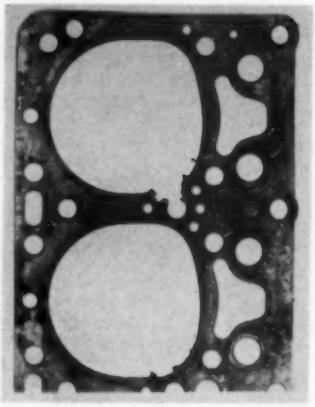


Fig. 1—Typical gasoline engine power, economy, and octane requirement curves.

Fig. 2—Typical failures resulting from fuel detonation. See effect on piston (above) and on gasket (below).



or incandescent deposits. It is not improbable that some supposed detonation may actually be traced to hot spots due to clogged engine coolant passages,[2] excessive spark retardation causing increased combustion temperatures, insufficient or improper cleaning of spark plugs with the resultant formation of carbon that may incandesce, and the use of improper spark plug gaskets or complete absence thereof preventing proper heat transfer.

Volatility Volatility affects starting, warm-up, vapor-lock, crankcase dilution, uniform performance, acceleration and complete combustion. Assuming that the mechanical condition of the engine is normal, a properly timed spark is supplied and other factors such as oil viscosity and battery strength

[2]This is a major reason for periodically cleaning the engine coolant system.

permit the engine to be turned over, then the temperature at which 10 percent of the gasoline is evaporated permits estimating the lowest atmospheric temperature at which the engine will start. Acceleration and warm-up are governed primarily by the 50 percent evaporation point of the gasoline although affected somewhat by the 10 percent point. The 90 percent evaporated and end points affect distribution, completeness of burning (crankcase dilution), and may affect acceleration. Vapor-lock is usually associated with vapor pressure; however, since vapor pressure is related to the boiling points of the hydrocarbons present, vapor-lock also depends on volatility. It is obvious that gasoline must evaporate quickly but not excessively so as to cause vapor-lock. At the same time insufficient vaporization in addition to giving poor power performance may lead to damaging of the engine since fuel in the liquid state can wash away lubricating oil from the cylinder walls, rings and other parts and dilute the crankcase oil.

Motor Gasoline Performance The engine imposes different requirements of volatility and octane number depending on the season (temperature) and the altitude; so it is obvious that the gasoline marketer must tailor his product according to seasons and areas. Since truck and bus engines in general are not as demanding as passenger car engines and gasolines are marketed to meet the requirements of the latter, the transportation field should have no particular difficulty in obtaining suitable gasolines.

In the past ten years it has been found that in addition to power performance gasolines contribute to engine deposits and copper lead bearing corrosion. The extent of the effect depends on engine operating conditions. Some data on these effects obtained in laboratory engine tests are shown in Fig. 3. It is pointed out that the fuels used were stocks obtained for laboratory purposes and the blends noted are not typical of any particular commercial motor fuels. By visual observation the engines appeared to be clean when total deposits as high as nine grams were evenly distributed on engine parts. In the corrosion test the weight losses below 0.5 gram are considered to be non-corrosive normal wear losses.

From these data it may be noted that under low-temperature engine conditions straight run stocks tend to produce little or no engine deposits while certain cracked stocks

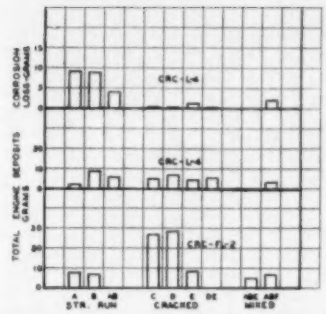
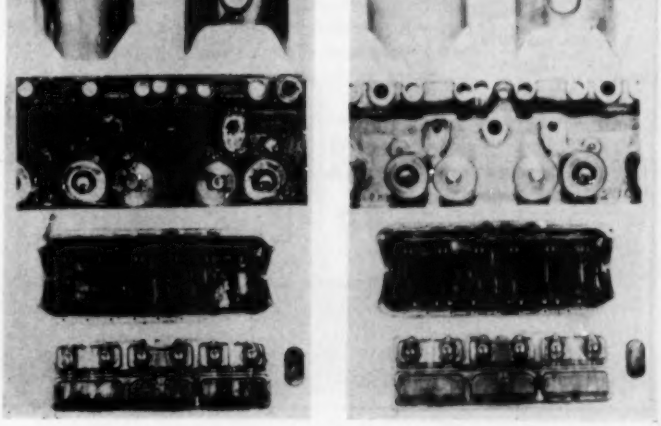


Fig. 3—Effect of motor gasoline types on engine deposits and bearing corrosion at different engine temperature levels.

may be heavy offenders. Under these low-temperature engine operating conditions in the laboratory, alloy bearing corrosion has never been reported. Under high-temperature engine conditions most fuels showed no significant effect on deposit formation but straight run fuels promoted alloy bearing corrosion. The difference in deposit formation attributed to the fuel in use under low temperature condition may be noted in Fig. 4.

Commercially available gasolines from reputable marketers appear to minimize these undesirable effects. It has been found that engine operation completely within the manufacturer's recommendations and ratings for coolant temperature, fuel-air ratio, timing and power demands, tend to minimize these deleterious effects. The use of proper motor oils drained at the right frequency also alleviate or minimize these conditions.

Fig. 4—Dirty (below) and clean (right) engine from low temperature operating conditions, showing fuel effect, with all other conditions constant.



The most recent problem being investigated in the gasoline engine field is that of combustion chamber deposits which tend to increase the octane requirement of an engine. At present it seems that the causes of this are a reduction in engine clearance volume and increased temperatures resulting from the insulating effect provided by the deposits. Since this imposes a limit on increasing engine compression ratios, with the motor gasolines available today, a method of minimizing these deposits is very desirable. The oil industry, fuel additive suppliers and engine builders are actively studying this problem.

Liquefied Petroleum Gases Natural gases and light petroleum hydrocarbons have been used for powering engines for a number of years. Both diesel and gasoline engines have been converted to this type of fuel powering. In the automotive field engine conversions to this type of powering were reported more than 20 years ago; however, in the last two or three years a large increase in use of LPG has occurred and wide interest on the subject has resulted. The interest was undoubtedly greatly spurred by a bus manufacturer whose engine was designed for high compression ratios and was easily modified to utilize propane. Another engine was announced as being suitably designed for propane. Conversion kits are available for practically all makes of automotive engines, although compression ratios of most engines cannot be materially increased so as to obtain full advan-

tage by using propane. In the truck field an engine modified for butane and propane powering has been available for quite some time. In 1952 propane-powered trucks as factory equipment approved by the Board of Fire Underwriters were announced.

The questions most generally asked are "What is LPG?" and "What are Liquefied Petroleum Gases?" It is quite obvious that these questions are identical since LPG is the alphabetical representation of the name; a common way of referring to long names that has crept into our language in the past 20 years.

In general LPG is predominantly either propane or butane with minor amounts of the other gases and perhaps very small amounts of heavier C_5 hydrocarbons (5 carbon atoms per molecule). When these gases are pressurized they assume a liquid state which is more suitable and economical for handling. The amount of pressure required for complete liquifaction varies with the composition. These gases as obtained in a natural state or from petroleum refining processes may contain impurities such as sulphur compounds and other contaminants which may be injurious to engine parts. The engine operator who uses LPG should have some assurance that these contaminants are minimized and that the composition of the fuel is constant since each of these gases has somewhat different characteristics as may be noted by the values for propane and butane shown in Table I.

It may be noted from Table I that at temperatures below 31 deg. F. at standard atmospheric pressure butane is normally in a liquid state and does not vaporize quickly enough to respond to engine demands. This fuel would be of little use to an engine equipped with a gas type carburetor at temperatures below 32 deg. F. unless a means of heating the fuel is provided. An easier solution would be to include some lighter gas like propane to lower the boiling point and increase vaporization of the fuel. Basis the vapor pressure of these two gases it is obvious that a lighter fuel tank (lower pressure) may be used for butane; however, for safety reasons it is wisest to use tanks able to sustain the worst pressure condition encountered. If definite codes are not established in any particular area, fuel tanks should be built in accordance with the API-ASME code for 250-lb. tanks.

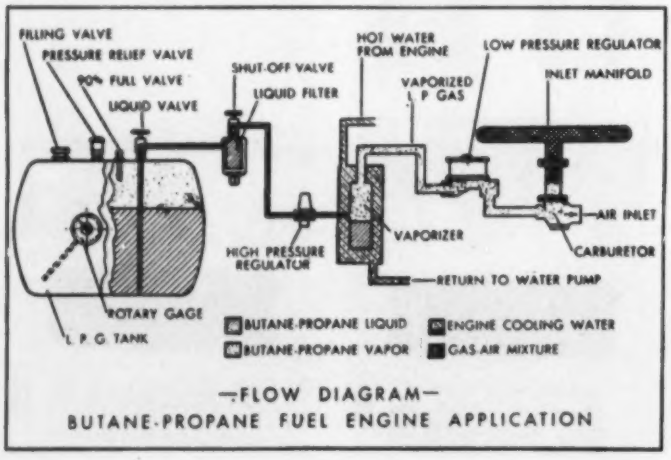
LPG fuel tanks should never be filled 100 percent full. A 10 percent to 20 percent vapor space must be allowed for expansion of the fuel with temperature increases. The larger value should be used if temperature variations may approach a 100 deg. F. spread. Some manufacturers include a "full" valve to indicate when the expansion space has been reached in the filling. This type may be noted installed in the tank shown in Fig. 5. When filling this type of tank, vapor is allowed to escape through the full valve. When the valve starts to drain liquid fuel, filling should be stopped as the expansion space has been reached. Another manufacturer includes an inner tank called an outage tank and the fill valve is arranged so that it seals off this expansion space during tank filling.

Propane and butane have higher heating values per pound of fuel than motor gasoline; therefore at the same compression ratio in a given engine at optimum conditions for each fuel it might be expected that for the same power more motor gasoline is required, but since slightly different air-fuel mixtures are necessary, economy on a power per pound of fuel basis is approximately equivalent for these fuels. In service, however, fuel economy is measured on a miles per gallon basis which would give motor gasoline approximately a 16 percent to 24 percent economy advantage depending on the composition of the LPG. By utilizing the higher octane ratings of LPG, particularly when it consists mainly of propane, and by using higher compression ratios to obtain more power per pound of fuel it is possible to improve LPG economy. It is claimed that in some cases in service m.p.g. economies of propane and motor gasoline are equivalent. It is strongly stressed that before any attempt is made to increase compression ratios of any engine more than one number the engine manufacturer should be consulted in regard to the advisability of the proposed modification.

In converting to the use of LPG some other points must be considered such as ignition timing. LPG has a higher ignition temperature than motor gasoline; therefore a hotter spark is required. This means that the ignition system must be kept in the best possible condition at all times. Also, spark timing must be adjusted for optimum performance from LPG. Hotter combustion temperatures are experienced which may require use of a "colder" spark plug and better valve materials and valve condition. Since the fuel is fed to the engine in a vapor state, manifold hot spots are not necessary and should be eliminated so as to obtain maximum volumetric efficiency. If the engine is to be used for both motor gasoline and LPG then some compromise must be made. Engine coolant temperatures must be kept high as will be noted below.

For practical reasons such as space saving LPG must be carried in the liquid state; however, it is best fed to the engine in a vapor state. The pressures in the fuel tank are too high to be applied directly to a carburetor and enough vaporized fuel is not readily available in the fuel tank to respond to the varied demands of an engine in automotive service. The transfer of fuel to the engine is usually done in four stages as may be noted in Fig. 5. The tank pressure of from 20 to 175 lb. must first be reduced to a regulated 4 to 10 lb. The fuel is then allowed to vaporize rapidly. In expanding and vaporizing a refrigerating effect is

Fig. 5

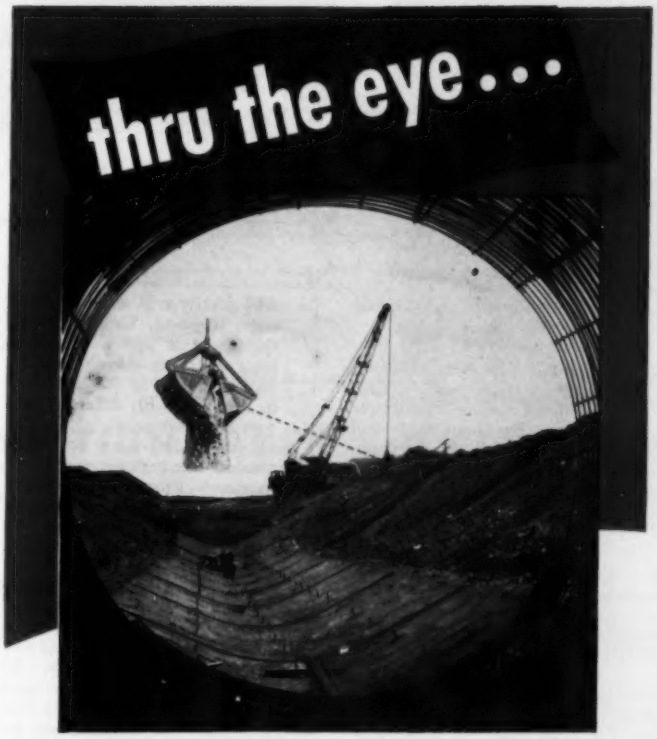


—FLOW DIAGRAM—
BUTANE-PROPANE FUEL ENGINE APPLICATION

created which could freeze up the mechanisms involved; therefore, the vaporizer must be heated. Heat is supplied from the engine coolant which is the reason for the higher jacket temperatures required in LPG service. The vaporized fuel must then be reduced in pressure from the regulated pressure to one slightly below atmospheric. This final regulator must shut off fuel below atmospheric pressure to prevent leakage and must be designed so that it will instantly permit vaporized gas to flow to the carburetor in metered volumes to conform to every engine demand. The last stage is carburetion which not only must mix fuel and air but must proportion the mixture to the right air-fuel ratio. It is quite obvious that these four stages may be combined so that more than one step is accomplished in one piece of mechanism.

The best systems should have perfect co-ordination between the final pressure regulation and carburetor throughout the entire range of engine speeds and loads, from fast acceleration to full throttle and back to idle. Flow characteristics must be similar to motor gasoline operation, that is rich for heavy loads and leaner for cruising, and must be instantaneous without over-richness for lean flat spot operation. Since this type of operation requires many sensitive valve actions, it is obvious that a filter is a definite necessity, and one usually is placed immediately beyond the fuel tank.

From the nature of LPG it would be expected that combustion should be complete with no engine deposits, no cylinder wall washing and no crankcase contamination. In practice, however, complete combustion is not always attained and the products formed will get into the crankcase as blowby material. Unless combustion is very poor and blowby excessive it is expected that these products would not materially increase engine deposits. However, butane and propane are straight chain hydrocarbons of the same type as are found in straight run gasolines, and the type of incomplete combustion materials formed upon entrainment in the lubricating oil can lead to alloy bearing corrosion. This may be noted from the data shown in Table II which are the results of evaluating a commercial grade of propane in the CRC-L-4 test. Note that a MIL-0-2104 oxidation stability level oil which was very satisfactory in this test using the normal L-4 test gasoline did not offset the effect on bearing corrosion of the fuel. It is obvious that for utmost protection



of a Culvert, a Contractor, or an Operator an OWEN BUCKET *"looks good"*

To a practical person looking out of a culvert such as this one, comes the suggestion of exceptionally great and economical digging ability or an Owen Bucket wouldn't have been selected.

To the contractor it recalls consistently good performance for years which has prompted him to reorder Owen Buckets year after year.

To the operator comes a reminder of how an Owen Bucket performs under varying difficult conditions, responding to his every demand and "stands up" with outstanding ability long after many buckets would have been relegated to the scrap heap.

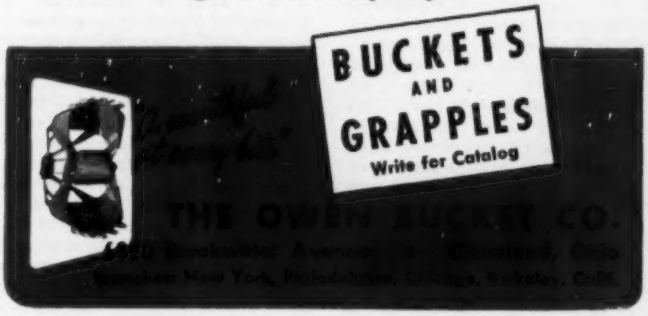


Table II—CRC-L-4 Test Results—Commercial LPG vs. Test Gasoline

Oil	Commercial LPG		L-4 Fuel
	Highly Refined Straight Mineral SAE 30	MIL-0-2104 Oxidation Stability SAE 30	MIL-0-2104 Oxidation Stability SAE 30
Cleanliness rating			
Piston*	8.2	9.5	9.0
Overall**	90	90	89
Bearing corrosion			
Gms./2 whole bearings	8.373	2.366	0.180
Neutralization No. increase	5.4	3.2	2.2
Viscosity SUS @ 210° F. increase	36	68	3

* 10—Completely clean.
**100—Completely clean.

high-quality heavy-duty oils should be used in LPG engine service.

Diesel Fuels The early diesel engines were mainly large slow-speed machines that were not too particular about their fuel diet. With the advent of the automotive high-speed diesel engine about 20 years ago the problem of obtaining a proper fuel became difficult for the operator. Due to the shorter interval of time available for combustion the high speed diesel could not satisfactorily burn the fuel oils commonly used in the larger slow-speed engines. The 400 deg. F. to 700 deg. F. fraction of petroleum crude distillation appeared to be a more desirable fuel oil for high-speed engine service. However, this same cut is the one that is used in cracking processes to meet the gasoline demands; furthermore the heavy hydrocarbons from the cracking process are still suitable for the low-speed engine. Light furnace oils were considered to be unsuitable since their lower viscosities appeared to be insufficient for injector lubrication. Ordinary methods of handling fuel oils resulted in products that were not sufficiently free of contaminants. Worst of all there was no uniformity of fuels as marketed in different areas even among those under the same trade name. Therefore it became necessary for the fuel supplier to provide better fuels specifically tailored for the high speed diesel engine.

The characteristics of a diesel fuel which must be considered are:

Pour Point—Below lowest temperature encountered so fuel will flow.

Viscosity—Sufficiently low to flow freely at lowest temperatures. High enough to lubricate injection system and prevent leakage. Correct for atomization and penetration requirements of the combustion chamber.

Cetane Number—Sufficiently high for satisfactory starting and proper combustion.

Gravity—Should be as low in API gravity as possible for maximum economy. Usually this requirement is waived to secure fuels of proper viscosity and ignition quality, as the difference in economy with different fuels may be rather small.

Carbon Residue—Low for clean combustion.

Corrosion — Free from corrosive materials.

Flash Point—Above legal requirements for safety.

Sediment—Should be nil.

For automotive diesel service it appears that fuel oils meeting the requirments of the ASTM-2D classification are satisfactory for over-the-road service while those in the ASTM-1D classification are most suited for operation within city limits particularly when smoke and exhaust odors are a problem. Distillate fuels containing no residual products and of sufficient ignition qualities (cetane number) when used in engines in proper mechanical condition achieve complete combustion with clear exhaust gases and a minimum of deposits. Many believe that cracked fuel oils, even when sufficient lubricating and ignition properties are available, are undesirable engine fuels since they promote deposits. This is not necessarily true as will be discussed later. As a result of the stringent requirements, the supply of the ideal fuels is naturally limited.

Starting Aids and Fuel Improvers After an automotive diesel engine has been started and operating temperatures have reached an equilibrium the engine will tolerate a wider range of fuels. Many innovations have been used in engine designs so as to be able to start on these fuels. Some of these methods and devices used are "punks", electrical air heaters, glow plugs, variable compression devices (starting on gasoline), coolant heaters and flame primers.

Starting capsules, primer and booster fuels and pilot injection are other methods used to aid starting with a wide range of fuels. These methods involve special injectors or pressure guns feeding the air stream or directly into the combustion chamber, some only at cranking time, others during certain portions of power demand, and some continuously. Some of the starting aids available produce high peak pressures in cylinders and although the engine may tolerate these loads during starting, early engine failure may result if used during regular engine operation. The operator is advised to consult the engine manufacturer before incorporating these methods in his operation.

Additive materials have been found which, when added to a diesel fuel, upgrade the cetane number. Since cetane number is a measure of the ignition quality of diesel fuels it would appear that the use of additives is advisable. Laboratory and field experience with "doped" fuels, however, produce many contradictory results as to startability, power performance and economy, and also many cases of increased objectionable deposits have been traced to these materials. If the opertor is using fuel that is tailored to his engine requirements he should never "dope" it up since in most cases he will be degrading his fuel.

Much has been said about the deleterious effects of sulphur in diesel fuel on engine performance particularly with respect to deposits and wear. However, it is believed that most people have learned that the alarm gong sounded a few years ago is now a mere tinkle. Most engines if operated according to manufacturer's recommendations will tolerate a much higher fuel sulphur content than was at first thought. Also, the oil industry has developed motor oils to offset effectively deleterious effects for cases where the engine is sensitive to sulphur in the fuel. In view of this no further comments on this subject are deemed necessary.

Cracked Fuels Approximately five or six years ago it appeared as though the increase in use of high speed diesel power would create a serious fuel supply problem for the oil industry. Subsequent findings revealed that much of this equipment was not as particular about its fuel as had been anticipated, so the supply situation was eased considerably. However, at the time of the threatening emergency work had to be done in an effort to obtain greater yields of automotive grade diesel fuel without interfering with supplies of other fuels. The problem was attacked from two sides: utilization of available refinery stocks, and improvement of refining methods. In

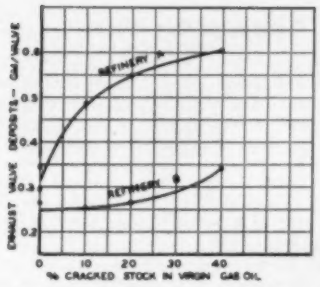


Fig. 6—Effect on exhaust valve deposits of increasing cracked stock concentration in virgin gas oils.

view of the present sharp increase in use of diesel powering for trucks and busses the results of these investigations may be of interest.

When future demands appeared to exceed the available supply of virgin gas oils (distillate fuels), light cycle gas oils (cracked stocks) were available with physical properties approaching those of virgin gas oils. Common thinking was that these cracked materials would promote heavy engine deposits. Therefore, it appeared desirable to actually determine whether small amounts of cracked stocks would degrade the performance quality of virgin gas oils. Accordingly stocks were obtained from two refineries whose crude sources were widely different.

In blending these stocks it was found that up to 40 percent of the cracked stocks could be included in the virgin gas oil from each refinery and still obtain the physical characteristics of an excellent automotive diesel fuel. The next step was to determine what effect on engine performance these blends would have. To do this the CRC-F-18 test procedure was followed using a two-cycle three-cylinder engine coupled to an absorption dynamometer and equipped with necessary instruments and controls to obtain the desired operation. The major operating conditions for this test as applied to the engine used were as follows:

Test duration, hours	80
Operating cycle—	
3 min. at 350 r.p.m.—no load	
7 min. at 1600 r.p.m.—58b.hp.	
Jacket temperature, out, °F	180
Oil temperature, °F	200

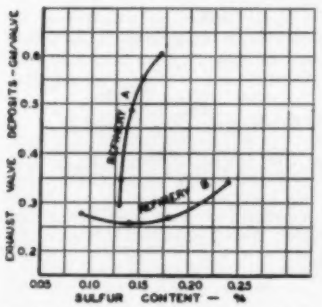


Fig. 7—Effect on exhaust valve deposits of fuel sulphur content.

The crankcase oil used was one that is qualified against the MIL-0-2104 specification normally recommended by the manufacturer for this type of engine. The test differentiates differences in fuel performance with respect to deposit formation, exhaust smoke and odor, and engine wear. The results showed no significant differences in performance between the 40 percent light cycle gas oil blends and the virgin gas oil stocks.

The testing could have been terminated at this point but to assure quality of the fuel it was necessary to carry out further engine tests that magnify differences in deposit-forming characteristics. It is well known that under light loads and moderate or low temperature conditions diesel engines will promote injector tip and valve deposits. Accordingly assorted blends containing up to 40 percent cracked stocks were evaluated in a two-cycle one-cylinder engine following a special test method whose major operating conditions are as follows

Test duration, hours	100
Engine speed, r.p.m.	1200
Engine load, b.hp.	5 (23.3BMEP)
Jacket temperature, out °F	140
Oil temperature, °F	205

The MIL-0-2104 qualified oil used in the previous tests was used in this engine.

The results obtained are shown in Fig. 6 which indicates the weighed exhaust valve deposits formed plotted against increasing cracked stock content of the fuel. It is quite obvious that a difference in deposit formation of fuels from different crude sources existed and the effect of cracked stocks from Refinery A were more pronounced. To assure highest quality the cracked stocks from Refinery A should be kept at a minimum while at Refinery B, in case demands were to increase, up to 40 percent of cracked stocks would be tolerable. No significant differences in injector deposits among these blends were noted; all were low.

In view of the interest in fuel sulphur content the deposit data were compared to the sulphur contents of the blends. This comparison is shown as Fig. 7. The data obtained were very consistent and indicated no correlation between amount of deposit and sulphur content as evidenced by the appreciable differences in deposits between fuel stocks having the same sulphur content. The trend of the curves, however, may indicate a possible small effect from the presence of sulphur, for Refinery B; but a very considerable effect for Refinery A.

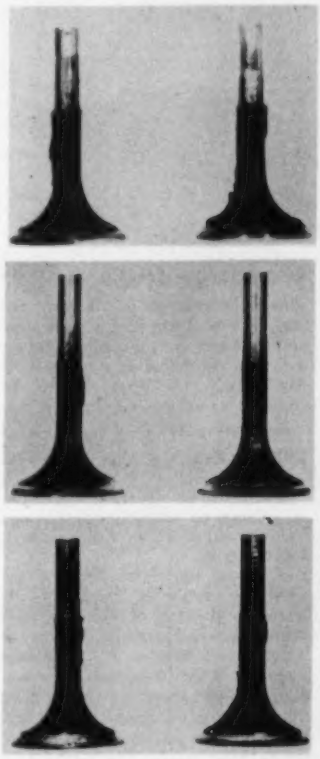


Fig. 8—Diesel engine exhaust valve deposits —low load test. Top, raw charge stock; center, furfural refined fuel oil; bottom, automotive diesel fuel.

To round out the program the fuels were subjected to stability and storage tests which showed no significant differences among the various blends.

Concurrent with this investigation pilot plant work was being done on solvent refining of diesel and domestic heating fuel oils. The refining technique involved the furfural process. This process improves catalytic cracked stocks to virgin gas oil quality as may be noted from Table III. Note the reduction in sulphur content, the cetane number improvement and the reduction of undesirable materials. Also, compare this furfural refined product to the commercially available automotive diesel fuel. The three fuels shown in Table III were compared by the low load

Table III—Effect of Furfural Refining of Catalytically Cracked Stocks

Fuel	Raw Charge Stock	Furfural Refined Stock	Commercial ASTM-2D Automotive Diesel Fuel
Gravity, °API	26.50	38.9	39.2
Viscosity, kin. @ 100° F., cs	2.79	2.87	2.61
Sulphur, %	0.65	0.11	0.34
Flash point, °F	220	190	168
ASTM distillation, IBP° F.	420	411	380
10% recovered, °F.	476	453	424
50%	509	508	502
90%	592	588	570
End Point	636	628	602
% Recovered	98.0	99.0	98.5
Cetane number	35.0	54.0	54.8
Carbon residue (10% resid)	0.27	0.03	0.02
Water and sediment, %	0.20	Trace	Trace

engine test and the following results were obtained.

Fuel	Exhaust Valve Deposits Per Valve—Grams
Raw charge stock	0.581
Furfural refined stock	0.127
Automotive diesel fuel	0.327

The improvement is obvious, also note how well the commercial automotive diesel fuel deposits compare with those obtained on virgin gas oils shown in Fig. 6. Some injector tip deposits were formed by the raw charge stock while the other two fuels left only traces of soot. Photographs of typical valves from this test are shown as Fig. 8.

All of the used crankcase oils showed no significant deterioration while these tests were conducted, as was expected from the oil used.

These data show that actual performance disproves the general thinking that all cracked fuels are undesirable diesel engine fuels.

(To be continued)

Killbuck Expands

(*From page* 129)

cone goes to the second compartment of the settling tank before going to waste.

A 24-in. by 162-ft. inclined belt conveyor carries the sand from the screw to the top of the two 36-ft. high silos which are also 20 ft. in diameter and have a live reclaiming capacity of 200 tons each. The sand is discharged direct to one of these silos for concrete sand. When both concrete and masons' sands are required, the sand is discharged from the conveyor onto a 3- by 6-ft. Telsmith Vibro-King 2-deck screen. This screen has 3 ft. of solid section and 3 ft. of 3/32-in. wire cloth on its top deck; the bottom deck is solid and it is equipped with sprays. The concrete sand over the top deck is chuted to one silo, and masons' sand off the bottom deck goes to the other silo. Cars or trucks are loaded through the same gates and chutes in the sides of these silos.

The 4-in. pump which feeds sand from the settling tank to the cone separator.

At times considerable material is stockpiled by means of an Ohio locomotive clamshell crane which is also used for switching and loading cars. A Barber-Greene Number 545 loader is used to load trucks from stockpiles, and a high lift is also used for this purpose. All truck shipments are weighed on a Fairbanks computing scale at the plant office. About 65 percent of shipments are made by rail. Most of the output is used in highway construction and surface treatment and in ready-mixed concrete plants in nearby cities.

This plant is entirely electrically operated, with a central substation and control board near the scrubber from which every item of equipment can be started or stopped. The entire plant has automatic sequence starting or stopping for efficient operation and for the protection of the equipment and employees. There are also separate switches at 19 different points in the flow. The water used for washing purposes and for drinking is provided by a 600-g.p.m. Peerless deep-well pump from a 77-ft. deep well. This plant is built entirely of concrete and steel and the conveyors are supported on steel frames and bents.

Manganese Ore Plant

(*From page* 130)

ard Steel Corp., where they are cooled to about 500 deg. F. The rotary cooler is 8 ft. in diameter, 98 ft. long, and brick-lined to within 30 ft. of the discharge end (with steel lifters in this 30-ft. section). The recovered heat from the cooler is fed back to the rotary dryer as secondary air.

The concentrated manganese ore as nodules, now assaying from 48 to 49 percent manganese, are stockpiled for assaying and blending and later shipped by railroad to designated steel mills.

Culligan Zeolite Company

(*From page* 133)

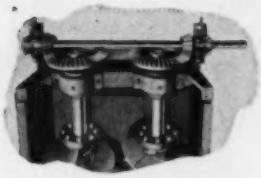
where it is packed in paper-lined burlap bags, usually containing 100 lb., with machine-sewn closures.

In the Culligan water-softening process, calcium and magnesium ions are removed from the hard water and replaced by sodium. When the zeolite eventually approaches the change to a calcium and magnesium compound, it is regenerated by treating with a salt brine to restore the sodium zeolite. This is a function of the far-flung Culligan local-dealer organization which services home, commercial, and industrial water-conditioners. The steel tanks and appurtenant equipment likewise are supplied by the Culligan Zeolite Co.

Besides zeolite, the Culligan operations near San Bernardino also produce silica gel in a separate department, the drying facilities previously mentioned being used, however, for both products. The silica gel is currently in critical demand as a dessicant in the moisture-proof packaging of military equipment. Small cloth bags of the gel, packed with the vital metal parts and equipment, adsorb moisture and protect against rust or corrosion.

P. H. Sunnes is manager of the San Bernardino plant. H. E. Oehler is the plant superintendent, and Cyril George is plant foreman. Dale Bergstedt is chief chemist.

The Spokane Portland Cement Company has granted wage increases of 15 cents an hour or more to its 120 employees at the Irvin plant east of Spokane, Wash. and at the Northport quarry. The new wage contract was negotiated with the United Cement, Lime and Gypsum Workers (A.F.L.) and is retroactive to July 1, according to G. M. Bell, company vice-president. Certain fringe benefits were also granted.



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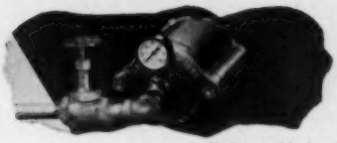
Readily adapted to power take-off from either side of tub. Quickly adjustable gear mesh.



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Pressurized water lubrication keeps abrasive materials out . . . adds years to bearing life!

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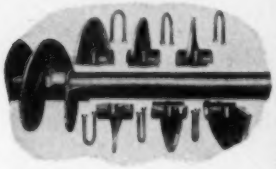
Gives you three times normal weir length—adjustable water volume control for greater fines retention.



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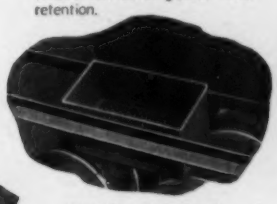

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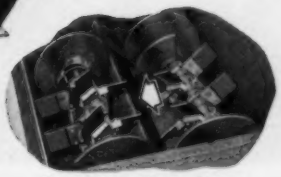

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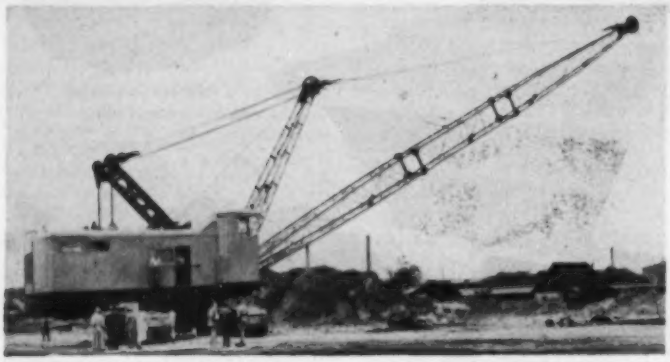


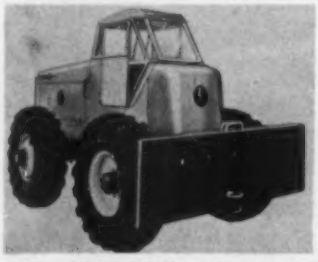
● Single Crawler Dragline

The "Model 1855" dragline produced by the Harnischfeger Corporation, Milwaukee, Wis., is said to be the world's largest dragline mounted on a single set of crawlers.

The new model has the capacity to handle an 8-cu. yd. bucket with a 120-ft. boom or a 7-cu. yd. bucket at 150 ft.

The machine is powered by a Cooper-Bessemer FV8 diesel engine that develops 590 hp. at 900 r.p.m. Power is supplied to the operating machinery by four Magnetorque drives which transmit power by magnetic pull without any mechanical linkage. This prevents shock loads and adds to the ease and smoothness of all motions of the machine.

The machine, which weighs 600,000 lb. is mounted on crawlers that are 60 in. wide and 29 ft. long. It is 32 ft. high, with the cab top 19½ ft. above the ground. The hoist line has a speed of 246 f.p.m., and the digging line has a speed of 199 f.p.m. with a pull of 75,600 lb. and 93,000 lb. pull, respectively. Rotating speed is 3½ r.p.m. and travel speed is ½ m.p.h.



● Four-Wheel-Drive Tractor

A large four-wheel-drive tractor has been announced by the Frank G. Hough Company, Libertyville, Ill.

The TM "Payloader" is available with a 106-hp. gasoline engine or a 90-hp. diesel and develops a drawbar pull of 16,000 and 14,000 lb., respectively.

Among the features are: full reversing transmission; four gear ratios in either forward or reverse; speed to 27 m.p.h.; torque converter drive in addition to a friction clutch; rear wheel steer with hydraulic booster; and large-size 16,00-24 tires all around.

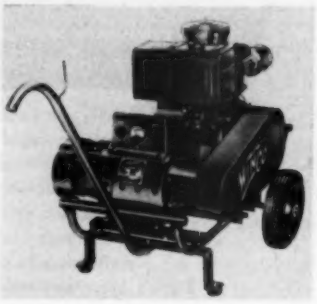
This tractor is designed for heavy pushing or pulling applications such as spotting cars and other heavy moving jobs.

● Chain Hoist

A chain hoist using coil chain instead of roller chain is now being manufactured by the Coffing Hoist Company, 800 Walter Street, Danville, Ill.

This model, the "R", is a ratchet-lever type and is made in 1,500- and 3,000-lb. capacities. Among the features are a safety handle that will bend when overloaded, a ratchet and pawl that serves as a positive brake, operation in any position with full or partial strokes, and accessible parts for easy servicing.

The hoist is designed to work in cramped quarters or with little head room. The use of coil chain permits the hoist to handle loads in any direction without binding.



● Portable Generator

A portable engine-generator set that delivers up to 4500 watts motor starting capacity has been announced by the Wincharger Corporation, E. 7 and Division streets, Sioux City 2, Iowa.

The "Model 4500" produces 115-volt, 60-cycle alternating current and will operate motors up to 1½ hp. It can be used for operating many portable tools or lighting systems, with continuous loads to 2,500 watts.

Among the features of the new model are a thermostatic cut-out switch, tubular steel cradle base, and "Speedy-Shift" portable base attachment for converting to a wheeled unit. Briggs and Stratton or Wisconsin 4-cycle engines are used to power the generators, or they may be obtained without an engine.

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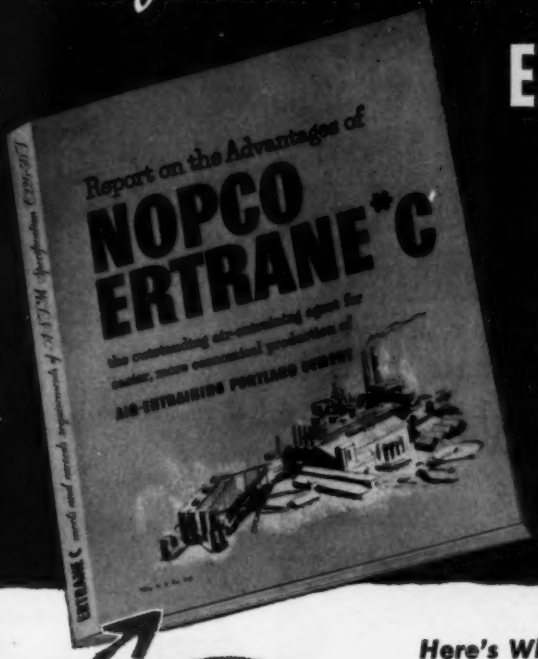

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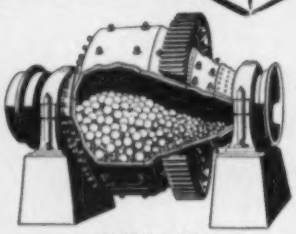
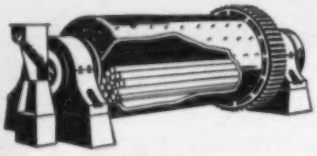
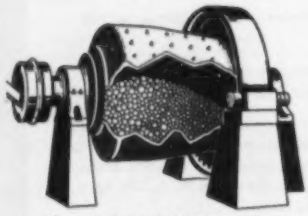
IS GRINDING YOUR PROBLEM?



CONICAL MILLS



ROD MILLS



TRICONE MILLS

TUBE & CYLINDRICAL MILLS

HARDINGE MILLS

CONICAL MILLS
—The Hardinge Conical Ball (or Pebble) Mill is unequaled in efficiency. Grinds wet or dry, in open or closed circuit. Outstanding feature: natural size segregation of grinding media, from feed to discharge. Bulletin 17-B-8 for dry grinding; Bulletin AH-389-B for wet grinding.

TRICONE MILLS
—Same ball segregation effect as obtained in the Conical Mill, plus additional grinding volume. Ideal for large capacity operations. Bulletin AH-414-B.

ROD MILLS
—Ideal for producing minimum oversize in open circuit grinding. Grinds either wet or dry. Convex heads reduce friction, prevent congestion of charge at the ends, and align the rods. Bulletin 25-B-8.

TUBE MILLS
—For a fine product in open circuit without the use of classifiers. For mixing and grinding to secure a smooth texture or plastic product. Bulletin 18-B-8.

CYLINDRICAL MILLS
—The Cylindrical Ball (or Pebble) Mills have demountable trunnions, and convex heads to reduce head liner wear and increase mixing action. Supplied with or without grates, as required. Bulletin AH-389-B.

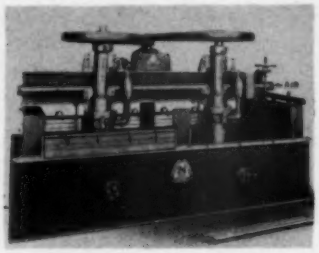
HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA—240 Arch St. Main Office and Works

NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

• Flotation Machine

A "Super Rougher Flotation Machine" is now in production by the Denver Equipment Company, Denver, Colo.

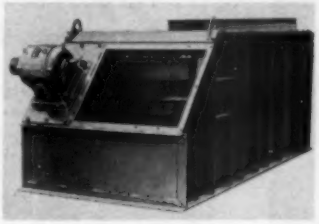


Designed for scavenging and roughing flotation, the machine features low-level froth overflow on both sides, an open type tank for pulp flow and super aeration, and two impellers on each shaft. It is said that this machine has the flexibility necessary to meet changing material characteristics.

• Vibrating Rod Grizzly

Nordberg Manufacturing Company, Milwaukee 1, Wis., has announced the production of the "Symons" Vibrating Rod Grizzly which is designed to scalp in excess of 400 t.p.h.

The grizzly, called type "K-RG", is for heavy-duty service in dry, wet, sticky, or gummy rock. It is available for separations from ½ to above 4 in., and is particularly useful following primary crushers and before secondaries.



The screening surface is 50 in. wide by 8 ft. long and has ½-in., ⅝-in., or ¾-in. spring steel rods arranged in three bays. The rods are held by a built-in screw clamping device, and are replaced through inspection and adjustment ports. Vibration is supplied by an unbalanced weight that is mounted at the discharge end. The deck will handle material up to 12-in. feed size.

• Rip-Proof Belting

Conveyor belting that is said to be virtually rip-proof is being marketed by the New York Belting and Packing Company, 1 Market Street, Passaic, N. J.

The belting, which is designed for service where ripping or tearing may be encountered, has a special carcass that has multiple strands of high-tensile steel wires embedded at 3-ft. intervals. Even if punctured, the tear is limited to about 3 ft. lengthwise by the construction. It is recommended for quarries and mines.

● Front-End Loader

A hydraulically operated front-end loader to fit Ford and Ferguson tractors has been announced by the Wagner Iron Works, 1905 South First Street, Milwaukee 1, Wis.

The new model, the "WM-4", has a capacity of ½ cu. yd. or a lift of 1000 lb. The bucket is powered by an independent hydraulic system that is tractor-mounted.

Eighteen different attachments are available for various applications. Included are backfill blades, snow plows, crane lift, snow buckets, and forks. Other improvements in this model are a reinforced dipper stick, longer dump reach, selective lift and height control, and a close-coupled bucket.

● Automatic Lubricators

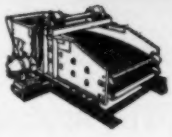
"Oil-Mist" lubricators with automatic warning devices when the oil level becomes too low are available from the Alemite Division, Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago 14, Ill.

The one-gallon oil reservoir models have built-in warning switches that signal by horn and red light when the oil level drops below a safe point and that shut off the machine. Units with a 12-ounce reservoir have the warning switches only or the cut-off switch.

These lubricators with the built-in signals are said to reduce dependence of the human factor in lubricating machines, and those with a cut-off switch eliminate the danger of a machine operating dry.

"DEISTERS Stand-up Far Better"

Enthused over Snyder & Sons' new Deister screen, Supt. Moss Davis said, "I've been in the gravel business 25 years and have used many makes of screens—but Deisters stand up far better than any other."



That was the consensus found among aggregates men by M. G. Snyder and Sons, Dayton, Ohio, aggregates operators, when they needed to replace an unsatisfactory screen a year ago.

Now, R. L. Snyder, General Manager, reports their satisfaction this way: "This is our first Deister. We like the way it turns out the work. When we found it necessary to replace an unsatisfactory screen, we checked with other plants around here, and bought a Deister because of the excellent reports we got on it."

Wire, phone or write for detailed information on Deister screens or the new Deister electric screen heating units.

DEISTER VIBRATING SCREENS & DEISTER ELECTRIC SCREEN HEATERS

DEISTER SCREENS

DEISTER MACHINE COMPANY
FORT WAYNE 4, INDIANA

● Oscillating Jaw Crusher

A crusher that combines oscillating and stationary jaws has been brought out by the El-Jay Manufacturing Company, 3440 Highway 99 South, Eugene, Oreg.

The crusher has two crushing chambers formed by an oscillating jaw moving between two stationary ones. The moving jaw approaches the stationary ones without any rubbing motion, which prevents an excessive amount of fines. Crushing stresses are divided between large roller bearings.

The "Gyrajaw" is made in 18-in. and 42-in. sizes that will handle 41 and 175 t.p.h., respectively. It is said that the crusher will handle muddy rock without clogging.

● Vibratory Conveyor

The Carrier Conveyor Corporation, 2144 Frankfort Avenue, Louisville 6, Ky., is the manufacturer of a line of vibrating conveyors that are marketed as the "Carrier Natural-Frequency" Vibrating Conveyors.

The Natural-Frequency conveyors are built in several sizes and in lengths to 150 ft. with single drive. The conveyor consists of a single trough that rests on heavy coil springs. The weight of the pan and the stiffness of the springs determine the frequency at which the pan will vibrate if pushed down and released. This frequency is used to adjust a motor and eccentric arm to supply energy to overcome friction and air resistance. The up-and-down motion of the conveyor, combined with a forward and backward motion, causes the conveyed material to be lifted forward and then dropped. This sends the material moving along in a series of hops. The usual rate is about 90 ft. per minute of forward movement.

By utilizing the natural vibrating frequency of the springs, it is claimed that power consumption is low and maintenance is kept at the minimum. In addition to transporting, these conveyors are also useful for cooling, screening, or dewatering at the same time.

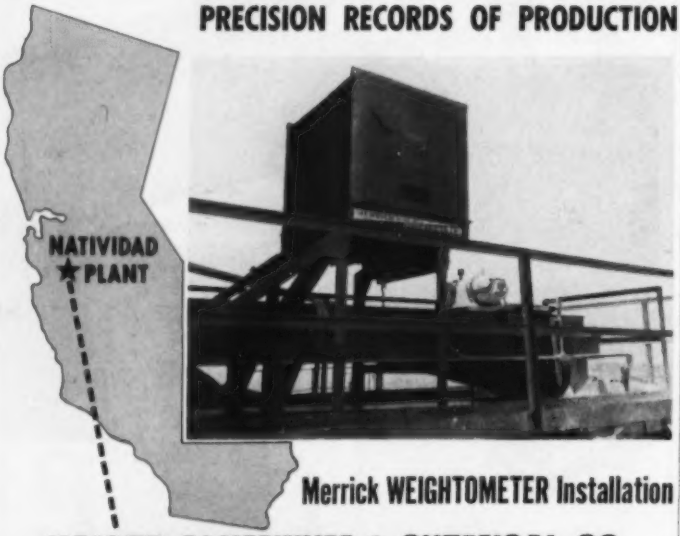
● Reciprocating Feeder

A ball bearing equipped reciprocating plate feeder has been announced by Lippmann Engineering Works, 4603 W. Mitchell Street, Milwaukee 14, Wis.

The feeder is 20 in. by 5 ft. and is driven by a babbitt-lined eccentric drive. Power is supplied by a 3-hp. variable speed electric motor gear reducer with belt drive operating over adjustable pitch sheaves for fine feed control of variable material. A dial showing speeds is adjusted to give speed variation to suit the material being fed. These adjustments are said to make constant feed flow easily accomplished in spite of variations in the fed material.

Where **MERRICK SCALES** *maintain*

PRECISION RECORDS OF PRODUCTION



Merrick WEIGHTOMETER Installation

KAISER ALUMINUM & CHEMICAL CO.

THE Kaiser plant at Natividad, California, has been producing *calcined dolomite* at an increasing rate for the West Coast steel industry.

The capacity of this plant was increased 50% in 1951, and a further improvement was made during 1952 by installing a heavy-media separation system to produce a higher quality of product.

A Merrick WEIGHTOMETER is used on the conveyor which carries the high-grade dolomite to storage ahead of the kilns.

This precision scaling unit *automatically* keeps an accurate record of the feed, on which the production, operating and control data are based.

The MERRICK Weightometer weighs and records bulk materials on a conveyor.

The MERRICK Feedoweight controls the feed of bulk materials by weight.

Merrick Scales make more efficient production lines

Write for Bulletins 375 and 551

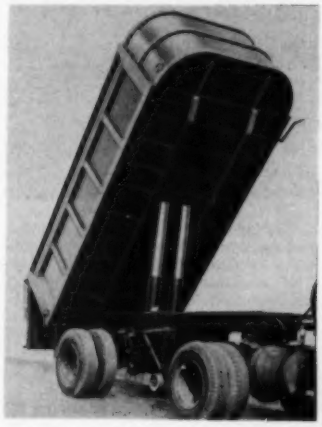
MERRICK SCALE MFG. CO.

180 AUTUMN STREET • PASSAIC, NEW JERSEY

● Trailer Dumps

A line of trailer dumps of up to 20-cu. yd. capacity has been announced by the Galion Allsteel Body Company, Galion, Ohio.

The Model "12" is a single-axle packaged unit of 10-gauge steel. It is 88 in. wide inside, with 32-in. sides and 44-in. ends. The length can be varied up to 18 ft.



Dumping is by a Galion Model "77142" hoist. This is a 7-in. twin-ram, single-stage, telescopic cylinder with a rated capacity of 18 tons.

The trailer suspension is by heavy-duty alloy main and auxiliary springs. Optional fifth-wheel or wet-nose mounting and choice of tire sizes and brakes are available.

● Shovel Loader

The Lull Manufacturing Company, 314 West 90 Street, Minneapolis, Minn., has newly designed the Model "3-B" shoveloader for attaching to Minneapolis-Moline Model RTI and Case Model VAI tractors.

This model has a ⅜-cu. yd. material bucket that is so mounted that a mowing attachment can be fastened to the tractor without modifications. The bucket has a lifting capacity of 1,800 lb. and a top lifting height of 9 ft. A parallelogram action keeps the bucket level during the lift.

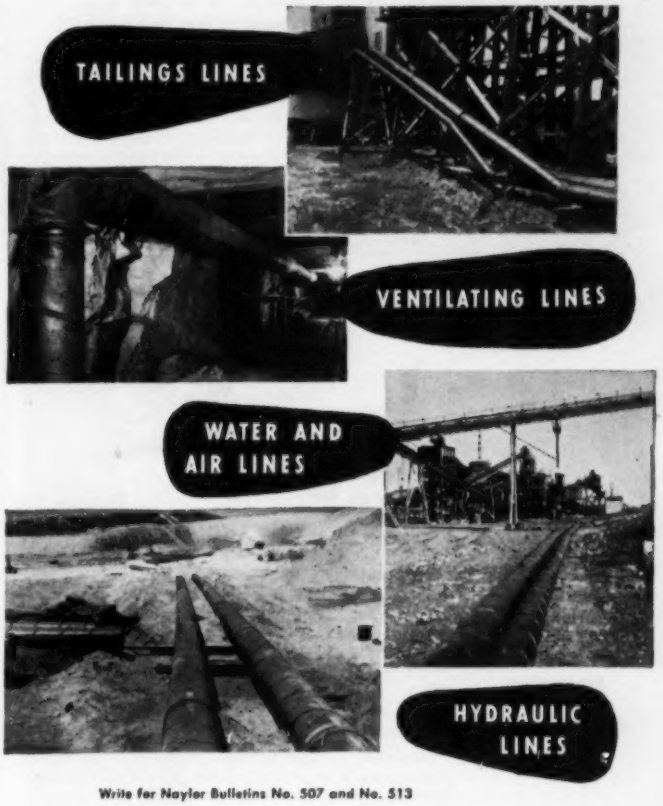
Attachments for use with the shoveloader include crane hooks, bulldozer blades, forks, coal and snow buckets, and fluid-driven sweepers.

● Bag Packer

An automatic bag packer that deaerates cement before packing it in the bag is being produced by Haver and Boecker, Oelde, Westphalia, Western Germany.

The cement, as a result of the deaerating, takes less space and may be packed into a bag that is about 2 in. shorter than used for fluffed material. This saves space and also reduces the cost of paper used in the bags. The Haver "BBV" Packing Automats have a capacity of 1400 bags per hour in the 4-spout model.

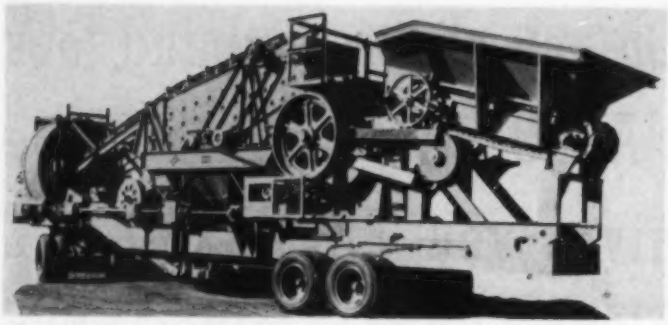
On any of these mining jobs NAYLOR Light-Weight Pipe gives you PERFORMANCE THAT SPEAKS FOR ITSELF



Write for Naylor Bulletins No. 507 and No. 513

NAYLOR PIPE

Naylor Pipe Company
1257 E. 92nd St., Chicago 19, Ill.
New York Office:
350 Madison Ave., New York 17, N.Y.



● Portable Crushing Plant

A new model portable crushing plant has been placed on the market by Universal Engineering Corporation, 625 C Avenue N.W., Cedar Rapids, Iowa.

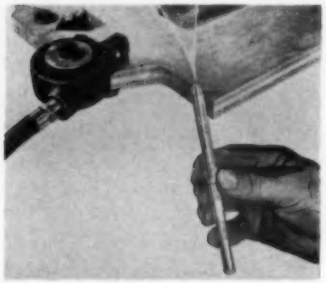
The new model is designed for 100 percent crushing and contains an 18- by 30-in. roller bearing jaw crusher, an 18- by 31-in. hammermill, and a 4- by 10-ft. gyrating three-deck screen.

By-passes are built in so that full product control is achieved. It is possible for this machine, "293QH Limerock Plant," to produce aglime, road rock, and chips simultaneously, all aglime, or other combinations.

The primary crusher, apron feeder, and operator's platform are mounted as a separate unit that is bolted to the main frame. This unit can be readily removed to reduce weight for traveling.

● Vibration Meter

An instrument for measuring the speed and amplitude of vibration on machinery or bins is being marketed by the Martin Engineering Company, Kewanee, Ill.



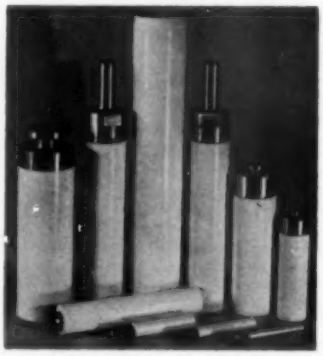
The instrument is about the size of a fountain pen and consists of a wire reed and a tuning slide. The "Fowler Vibra-Tak" is operated by placing the nose of the instrument against the vibrating object and then moving the tuning slide until the wire reed is vibrating at its maximum throw. The scale is multiplied by 1,000 to obtain the vibration in cycles per minute, or shaft speed in r.p.m.

The instrument is useful in finding the vibrations per minute of bins, hoppers, and other vibrated equipment; and in locating dead spots on vibrated equipment; and in finding unwanted vibration on machinery. It also measures the r.p.m. of high-speed machines if vibration is present.

● Ceramic Pump Plungers

Pump plungers of high-strength alumina ceramic are being manufactured by the Coors Porcelain Company. These plungers are designed for high pressure applications with corrosive or abrasive materials. They are made in size from 7/16 in. to 5 in. in diameter.

The plungers are made from a solid



bar of ceramic and are ground to close tolerances, with highly polished surfaces. They have been used for pumping mud, cement, and other abrasive materials under high pressure. The plungers are distributed by Landes, Zachary, and Peterson, 2500 West 7 Avenue, Denver, Colo.

SIGNS IDENTIFY!

. . . HEADQUARTERS for a GENERAL of the ARMY

AUTHORIZED AIRCO DEALER

. . . Headquarters for Welding and Cutting Apparatus

TAKE HARDFACING ALLOYS, FOR INSTANCE . . . Your authorized Airco dealer handles more than twenty types of hardfacing rods — to combat abrasion . . . impact . . . heat . . . corrosion. Every type of wear problem! He can show you how one application may add 2 to 25 times longer service life to new or worn parts.

Every item is backed by AIRCO's reputation . . . and delivered promptly to your door!

Whether you want to buy . . . or simply seek information, check your Airco dealer first! Consult your classified phone directory (under Welding Equipment and Supplies) . . . look for this famous sign.

AUTHORIZED AIRCO DEALER

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AT THE FRONTIERS OF PROGRESS YOU'LL FIND AIR REDUCTION PRODUCTS

Warner Company Reports Lower Income, Good Prospects

Officials of the Warner Company recently published their semi-annual report for the period ending June 30. In explanation of a decline in both gross sales and income before taxes from the figures of the comparable period in 1951, it was indicated that major factors were unfavorable weather—two months of frequent rains—and the steel strike. Despite these and other difficulties, the drop in final net income—from $1,137,560 in 1951 to $1,037,747 this year—was only 8.8 percent.

Capital expenditures during 1951 were above normal, the total amount in construction and equipment being $3,036,000.

Charles Warner, chairman of the board, and John Curtin Jr., president, stated that the early conclusion of strikes affecting the firm's sales and the backlog of large projects now in prospect should "maintain good activity" for the company for three or four years.

Armour Research Foundation Receives Sintering Machine

A laboratory-type sintering machine has been donated to the Armour Research Foundation of the Illinois Institute of Technology by the Duncan Foundry and Machine Works, Alton, Ill.

Valued at $6,600, the machine is a pilot plant model. It will be used for studies of lightweight aggregates for concrete and the treatment of finely divided ores. The Foundation has been active in the development of improved concrete aggregates.

The American Ore Reclamation Co., Chicago, assisted in arrangements for the donation of the sintering machine.

Data Book for Engineering Goes into Second Edition

Completely revised and greatly enlarged, new second editions of the first two volumes of Elwyn E. Seelye's well-known *Data Book for Civil Engineers* have been published by John Wiley & Sons.

Together, Volume I—*Design*—and Volume II—*Specifications and Costs*—provide a concentrated collection of data necessary to design and place under contract all types of engineering projects.

Volume III published in 1947, is on field practice. It provides information needed for the inspection of all types of engineering work, as well as data on surveying.

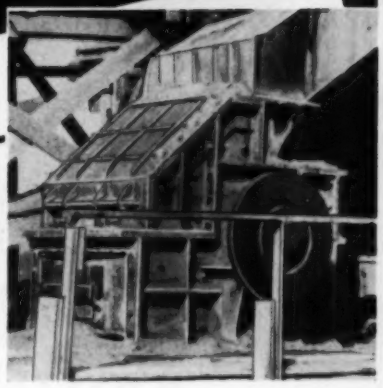
Volume I (second edition), 528 pages, $10 per copy; Volume II (second edition), 506 pages, $13 per copy; Volume III, 306 pages, $5 per copy.

On August 21 the address of the Perlite Institute headquarters was changed to 10 East 47th Street, New York, N.Y., Room 1210. The organization's former offices were located on 53rd Street.

ANOTHER
AMERICAN HAMMERMILL
PERFORMANCE REPORT

50,000 TONS OF -5" ROCK TO AGLIME
. . . WITHOUT A SINGLE REPAIR

FIELD REPORT
No. 21
Illinois Quarry



TYPE OF CRUSHER: American ASC No. 4 Up Running Hammermill.

OPERATION: Reducing minus 5" rock to agricultural limestone.

PRESENT CAPACITY: 60-120 tons per hour, depending on moisture content of stone.

PROBLEM: Very wet rock, showing 8% moisture—sticky at all times.

COMMENTS FROM USER: "Hammer wear is remarkable: 9400-9700 tons of lime ground to 100% passing No. 8 mesh, per set of hammers . . . Remarkably efficient mill . . . meets our requirements in every way."

Write: for Bulletin No. 147—"Better Stone Crushing"

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1059 MACKLIND AVE.
ST. LOUIS, MO.

Assure *Free-Flowing* Bins, Hoppers and Chutes with

SYNTRON

"Semi-Noiseless"

ELECTRIC VIBRATORS

Now, Syntron presents a complete line of Semi-Noiseless Electric Vibrators for use in installations located close to workers where noise is a major factor.

They operate the same as standard Syntron Vibrators — their 3600 vibrations per minute assure a smooth, controlled flow of material — cause the most stubborn material to flow freely thru bins, hoppers and chutes.

Syntron Electric Vibrators provide a safety factor by eliminating the necessity for your men to climb ladders or framework and balance in precarious positions while spading, rodding or sledging clogged materials.

They save their cost, over and again, by eliminating damage to equipment by sledging and rodding, cutting down replacement costs, and by preventing loss of costly time due to material coming 'short' on dependent operations.

Semi-Noiseless models are available for application to any size and shape of bin, hopper or chute — whether made of steel, wood or concrete. New 'cushion' action provides a sharp reduction in the operating noise.

Write Today for Free Illustrated Catalog Folder

Flat Bottom Bin with Center Discharge

Wooden Hoppers

Concrete Hoppers

Inclined Chutes

Hopper with Sloping Discharge

SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

STATEMENT OF OWNERSHIP

Statement required by the Act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1952.

1. The names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, Complete Service Publishing Company, Chicago, Ill.; Editor, W. E. Trauffer, same; Managing Editor, W. E. Trauffer, same; Business Manager, James E. Montgomery, same.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Complete Service Publishing Company, Chicago, Ill.
James E. Montgomery, same.
Evelyn W. Montgomery, same.
Stanley A. Phillips, Evanston, Ill.
Florence S. Phillips, same.
Ray L. Smith, Jr., Bartlett, Ill.
Lanetta B. Smith, same.
William T. Klussman, Brookfield, Ill.
Walter E. Trauffer, Evanston, Ill.
Emma M. Trauffer, same.
William A. Wilson, Bronxville, N. Y.
Kathleen Wilson, same.
Chas H. Bussmann, Lakewood, Ohio.
Jane L. Bussmann, same.
Frank J. Cornyn, Chicago, Ill.
Jeanette M. Cornyn, same.
George P. Grant, same.
Belle M. Grant, same.
William M. Avery, Glen Ellyn, Ill.
Isabel F. Avery, same.
Harry F. Utley, Whittier, Calif.
Melva Mae Utley, same.
William T. Klussman and Lanetta B. Smith, Trustees of Bernice Joan Smith, Trust No. 1, Chicago, Ill.
William T. Klussman and Lanetta B. Smith, Trustees of Harry William Smith, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Ray Light Smith, 3rd, Trust No. 1, same.
William T. Klussman and Lanetta B. Smith, Trustees of Stephen Howard Smith, Trust No. 1, same.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was. . . . (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

JAMES E. MONTGOMERY,
Signature of Business Manager.

Sworn to and subscribed before me this 29th day of September, 1952.
(SEAL) FRANK J. CORNYN.
(My commission expires Sept. 5, 1954.)

A report issued by the Dragon Cement Company, Inc., New York, N. Y., shows the following totals for the year ended June 30, 1952: net sales—$9,138,233, as against $9,075,401 in 1951; earnings per share (170,123 outstanding)—$4.21, as against $4.12 (225,000 shares outstanding) in 1951; net profits—$716,738, against $927,053 in 1951.

U. S. Gypsum Company has moved its Southwest sales division from Chicago to 6810 Harry Hines Boulevard in Dallas, Tex.,

personal mention

JAMES A. FOSTER, senior engineer of the Highways and Municipal Bureau, Portland Cement Association, Chicago, has been appointed assistant manager of the bureau effective October 1, 1952, according to an announcement released by Carl D. Franks, the Association's executive vice-president. Mr. Foster succeeds L. M. Arms, who was appointed bureau manager last July.

A graduate of Princeton University, Mr. Foster received a degree of civil engineer in 1918. He joined the Association staff in 1936 as a member of the Highways and Municipal Bureau. Prior to joining the Association he served with the Illinois Division of Highways and with Consoer, Older and Quinlan, consulting engineers.

Memberships in technical organizations include the Western Society of Engineers, the Highway Cost Committee of the Highway Research Board, and the Highway Taxation and Finance Committee of the National P.A.R. (Project Adequate Roads) Committee. Mr. Foster is also a registered professional engineer in Illinois.

W. L. NEWHALL has been appointed director of the Department of Research and Development for Dravo Corporation and subsidiaries, including its Keystone Division, which produces sand and gravel, concrete, and concrete products. Named as assistant directors were C. R. HORTON JR. and A. J. LIEBMAN.

Mr. Newhall is a graduate of the Massachusetts Institute of Technology and has been with Dravo Corporation since 1925. Before his new appointment he was assistant general manager of the corporation's Engineering Works Division.

The following appointments were announced recently by the International Minerals and Chemical Corporation:

JOHN P. BURROWS is now general purchasing agent for the corporation. RALPH PANIELLO was named sales manager, South America, of the Rock Phosphate Department (Phosphate Division). Mr. Paniello joined International in 1949.

LEONARD B. GITTINGER has been promoted to the position of director of market research for the Freeport Sulphur Company, New York, N. Y.

M. A. RIKARD, vice-president of the Southern Cement Company, Birmingham, Ala., was unanimously elected the 1953 program chairman of the Operating Division of the National Lime Association at the N.L.A. Operating Meeting held at Mountain Lake, Va., in September.

G. F. COOPE, president of the Potash Company of America, has been appointed a member of the tax committee of the United States Chamber of Comerce.

FRANK E. JOHNSON was named deputy administration for the Defense Minerals Exploration Administration on September 23. Mr. Johnson was formerly acting deputy of the agency.

RONALD E. DANIELS, vice-president and secretary of Federal Portland Cement Company, Inc., Buffalo, N.Y., has been elected president of the National Mineral Wool Association.

3 Important Screening Advantages

The Leahy Screen equipped with FlexElex offers three important advantages in the screening of Lime, Ag-Lime or Silica Sand.

(a) By keeping the mesh wide open for full capacity screening at all times, production is substantially increased.

(b) You can, if you wish, use a finer mesh than you formerly considered practical.

(c) Because the cleaning of glazed-over mesh is eliminated the life of your screen cloth is multiplied.

Only Leahy offers you the double advantage of FlexElex electric jacket heating for complete elimination of blinding by damp fines . . . and Differential Vibration which snaps loose intermediate wedging size particles.

The DEISTER CONCENTRATOR COMPANY

The Original Deister Company, Inc. 1906

911 Glasgow Avenue, Fort Wayne, Indiana

obituaries

STANLEY G. STEWART, 70, vice-president and director of Consolidated Cement Corporation, died on August 11 at a Kansas City, Mo., hospital. He had been in ill health for three years.

Prior to becoming an executive of Consolidated, Mr. Stewart was associated with the Arkansas Bridge Company and the Kansas Cement and Material Company.

GILBERT F. SLAMA, superintendent of the sales department, the Cleveland Quarries Company, died in Cleveland on August 17 at the age of 51 years.

WILLIAM P. REGAN, 62, employed in the Sales Division of Hercules Cement Company, Philadelphia, Pa., 15 years, died of a heart attack on August 27 while playing golf. He was an Army Air Corps veteran of World War I and a member of the American Legion.

JOE W. SPARKMAN, owner of the Sparkman Gravel Co., Dallas, Tex., died recently at the age of 44.

J. A. DUNAWAY, vice-president of the Peery Lime Company, North Tazewell, Va., died on July 27. Mr. Dunaway had served as a director of the National Lime Association for 12 years and was well known throughout the industry.

EDWARD LEISENRING, chairman of the executive committee of the Whitehall Cement Manufacturing Company and of a number of other firms, died unexpectedly at his home in Bryn Mawr, Pa., on June 16. He was 57 years old.

CHARLES W. STIMSON, a member of the board of directors of the Superior Portland Cement Company, Seattle, Wash., and prominent in industrial and financial groups of the Pacific Northwest, died on October 2 in his home after an extended illness. He was 73 years old.

CLARENCE F. FEHNEL, 67, a retired assistant general purchasing agent for the Penn-Dixie Cement Corporation, died in his home in Nazareth, Pa., on October 7, He had been retired since 1946, after having been associated with the cement industry for more than 40 years. He was secretary and purchasing agent for the Dexter Portland Cement Company from 1912 to 1926, when the company merged with Penn-Dixie.

RANDOLPH SNODDY, 75, former sand-and-gravel operator of the Des Moines, Iowa, area, died on September 22 at a hospital in that city. He retired 25 years ago as manager and superintendent of the former Coon River Sand and Gravel Company, now the Coon Valley Gravel Company.

ARTHUR J. LITTLE, works manager of the Baybridge plant of Medusa Portland Cement Company, died recently in Sandusky, Ohio. A chemical engineer who attended Purdue University, he has worked for the Baybridge plant for nearly 35 years, first when it belonged to Sandusky Cement Company and later when Medusa took it over. In his early career he worked on a dam construction in Spain and also served as first lieutenant in the field artillery in World War I.

FREDERICK E. HALL, past president of T. J. Hall Sand & Gravel Co., Cincinnati, Ohio, died on August 23 at a hospital in Covington, Ky., after a long illness. He had been a member of several well-known organizations, including the Ohio and the National Sand & Gravel Association.

GEORGE E. CHRISTOFF, 58, chief electrical engineer at the Marquette Cement Manufacturing Company at Cape Girardeau, Mo., died on June 14 at a local hospital. Mr. Christoff had been affiliated with the Cape Girardeau Portland Company before joining Marquette. He served in Des Moines, Iowa, while the Marquette plant was being erected there, and also at Brandon, Miss., during the construction of the company's facilities at this location.

ALEXANDER S. BAIRD, formerly a Philadelphia representative of the National Portland Cement Company, died at the age of 71 years in his summer home at Ocean City, N. J.

BARNEY C. GIMM, retired from the Universal Atlas Cement Company plant at Independence, Kans., since 1942, died recently at the age of 76. He had worked at the Independence plant for 38 years, serving last as a general mill foreman.

B. L. MOORE, one of the Iowa pioneers in the limestone business, died recently. Mr. Moore was at one time affiliated with M. O. Weaver, Inc., Des Moines, Iowa. Subsequently he operated his own quarry, the last location being near Burlington, Iowa.

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Blast hole drilling is routine—thanks to Rok-Bits—at all three Weston & Brooker quarries.

Detachable, tungsten carbide Rok-Bits increase drilling speeds up to 50%, cut bit cost, drill single gage holes to put more dynamite at the bottom, minimize bit changing. Plan to put these Rok-Bit advantages to work for you. Request bulletin. Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa.; 350 Depot St., Asheville, N. C.

Intra-Set Chisel or 4-point — gage sizes, 1¼" to 2¼". Suitable for primary and secondary drilling.

Carbide Rok-Bits: Chisel or 4-point — gage sizes, 1⅛" to 4"

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CARBIDE ROK-BITS • INTRA-SET ALLOY DRILL STEEL • LONG HOLE DRILLING TOOLS • HOLE-SAVERS • ALL TYPES OF HOLLOW DRILL STEEL

trade notes

Appointment of Jack W. Kiddy as east-central district manager for the Davey Compressor Company, Kent, Ohio, has been announced. He will be in charge of company operations in northern Ohio, Michigan (except the northern peninsula), western New York, northwestern Pennsylvania, and the province of Ontario, Canada, with headquarters in Kent. Mr. Kiddy has been associated with the company for three years as a member of the headquarters staff.

R. W. Miller

Robert Watt Miller has been elected a director of Caterpillar Tractor Company, to fill the vacancy created by the death of his father, C. O. G. Miller, who died on April 23.

Mr. Miller, president of the Pacific Lighting Corporation of San Francisco, was born in Oakland, Calif. He attended Yale University, leaving to become associated with Blair & Company, San Francisco investment firm.

Mr. Miller joined the West Coast utility company, and worked through the organization until 1941, when he was elected president. He is a director of American Air Lines, the Standard Oil Company of California, J. A. Folger & Company, the American Trust Company, the Pacific Public Service Company, Pabco Products, Inc., and the Tucker Investment Company.

J. G. Wilson

Jerry G. Wilson has been named engine sales supervisor in the Sales Development Division at Caterpillar Tractor Co., Peoria, Ill.

Mr. Wilson, who has been a special representative in the Sales Development Division since joining Caterpillar in 1950, will coordinate and direct the activities of engine representatives.

He was educated at Northwestern University and the University of Wisconsin and later worked successively for Superior Engine Division of National Supply Co., Heavy Machinery Sales of Nordberg Manufacturing Co., and the Diesel Department of Fairbanks-Morse & Co.

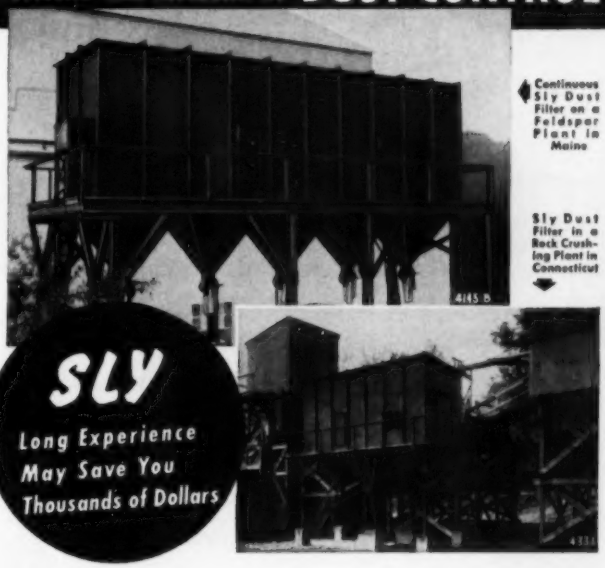
George W. Roper has been promoted to the position of assistant technical director of the dust and fume control division, American Wheelabrator & Equipment Corporation, Mishawaka, Ind., according to a recent announcement.

R. J. Furstross

Ralph J. Furstross has been appointed assistant director of research for Caterpillar Tractor Co. He takes charge of tractor and earth-moving research projects. His most recent assignment in research department has been that of staff engineer.

Mr. Furstross joined Caterpillar in 1934, and became a field engineer in 1936. Subsequently, he was made supervisor of field engineering, the job he held prior to his most recent assignment.

PIONEERS and LEADERS IN DUST CONTROL


Continuous Sly Dust Filter on a Feldspar Plant in Maine
Sly Dust Filter in a Rock Crushing Plant in Connecticut
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YOU CAN DEPEND ON

TY-ROCK SCREENS

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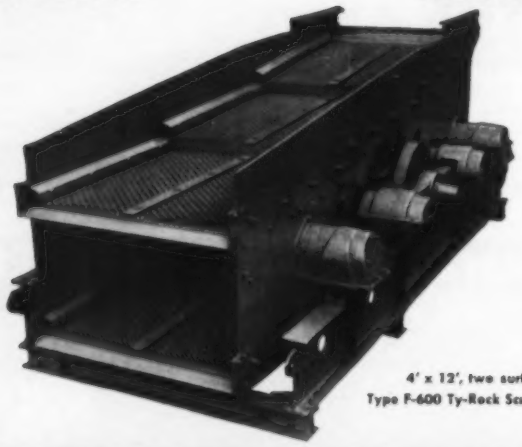

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CHICAGO STEEL FOUNDRY CO.
Kedzie Ave. & 37th St., Chicago 32, Ill.
Makers of Alloy Steel for Over 40 Years

International Harvester Company recently opened a new motor truck engineering building at Fort Wayne, Ind. This structure, which was erected at a cost of $8,000,000, will house all the activities in connection with designing and testing of International trucks. It contains facilities from drafting rooms to accelerated road tests, so that all operations from designing of new parts to final proving can be done in one place.

Cantwell Machinery Company, Columbus, Ohio, has been appointed distributor for the state of Ohio by the McLanahan & Stone Company. Thomas E. Morgan, sales manager, will direct the sales efforts.

Ralph Hunt, formerly with the Stedman Foundry and Machine Company, has opened a manufacturers' representative office at 317 McKinley Avenue, Kenmore 23, N. Y. Included in the products that he will represent are the vibrating screens made by the Deister Machine Company, in central and western New York and northern Pennsylvania.

Joe Klemeyer has been appointed general manager, and Wayne Burnside was named sales manager of the Rock Bit Sales and Service Company, Philadelphia, Pa.

Mr. Klemeyer was formerly sales manager of Brunner and Lay, the parent organization. Mr. Burnside has been with Rock Bit Sales and Service.

E. A. Bowman has been named sales manager of Brunner and Lay, replacing Mr. Klemeyer. He was formerly sales representative for the central states.

L. B. Smith, Inc., Camp Hill, Pa., announces the election of the following officers: L. B. Smith, president and treasurer; Ralph M. Kolze, executive vice-president, secretary, and assistant treasurer; C. R. Smith, vice-president and assistant secretary; E. A. Woolford, vice-president and sales manager; Charles G. Fry Jr., vice-president and manager of the Motor Division; T. A. Rose, vice-president and manager of the Syracuse, N. Y., branch.

Ralph B. Maltby, vice-president and a director of St. Regis Paper Company and for ten years mayor of Bronxville, N. Y., died at his home recently.

The Cleaver-Brooks Company, Milwaukee, Wis., has appointed the Western Traction Company, 2230 Third St., San Francisco 7, Calif., as northern California distributor for its Road Machinery Division.

The new distributor has three branch offices: Contractors Equipment and Supply Company, 1143 C St., Fresno; George M. Philpott Co., 725 Thirty-Third St., Sacramento; and W. E. Pierce Co., Fourth and Broadway, Eureka.

Wayne H. Hunter has been appointed assistant sales development manager of the Republic Division, Lee Rubber and Tire Corporation, Youngstown, Ohio.

At a meeting of the board of directors of the Macwhyte Company, Kenosha, Wis., the following were elected directors—E. C. Berg, G. Johnston, and M. A. Buntrock. Mr. Berg was also appointed vice-president and controller; and Mr. Johnston was appointed treasurer and assistant secretary. Mr. Buntrock is secretary and assistant treasurer.

N. C. Hays

The appointment of N. C. Hays as west central district manager for the Davey Compressor Co., Kent, Ohio, has been announced. He will be in charge of company operations in New Mexico, Arizona, Utah, Colorado, Wyoming, Idaho, Montana, the Las Vegas, Nev., trading area, and the provinces of Saskatchewan and Alberta, Canada.

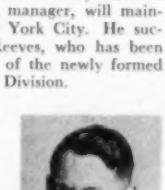
An alumnus of Denver University, Mr. Hays was formerly sales representative for the H. H. Nielson Company, Davey distributor in Salt Lake City. He also served as sales representative for the Minneapolis-Moline Co.

cut

Pioneer Engineering Works, Minneapolis, Minn., announces the appointment of J. Miller Brown as export manager. Mr. Brown has been sales engineer for the company in the southwestern states since 1946.

William N. Bennett has joined the Bridgeport Chain & Mfg. Co., Bridgeport, Conn., as New England district manager of the firm's Materials Handling Division.

Appointment of Harry C. Oliver as sales manager of U. S. Tires was announced recently. Mr. Oliver, who has been assistant sales manager, will maintain offices in New York City. He succeeds Lawler B. Reeves, who has been appointed manager of the newly formed Oil Marketer Sales Division.



E. D. Tull

E. D. Tull has been named to the newly-created position of vice-president and general manager of Cummins Engine Company, Inc., Columbus, Ind.

Mr. Tull, a native of Columbus, has been with Cummins since 1928. In February he was named vice-president of personnel and plant and recently was elected to the board of directors. As vice-president and general manager, he will be responsible for co-ordinating the work of the five divisions of the company.

Canadian Machinery and Industry Construction, Ltd., has purchased the former government-financed cement plant at Cornerbrook, Newfoundland, according to a statement from Premier Smallwood. Although the price was not disclosed, the new owners made a cash down payment and plan to pay 4¾ percent interest on the purchase price plus the cost of a 3 percent annual sinking fund.

The appointment of V. Z. Pavlenko as assistant export divisional manager of Caterpillar Tractor Co., Peoria, Ill., has been announced.

In his new duties, Mr. Pavlenko will assist Jean Walker in administering export sales activities in Africa, India, Pakistan, and the Middle East. He will continue to direct the export training program and will be assisted by Richard Kendizor, who recently returned from two years' service in India.

Dan Urban, sales engineer of The Kent Machine Co., Cuyahoga Falls, Ohio, recently returned from a month's business trip to South America.

He flew to Bogota, Columbia, and then traveled 125 miles by auto to Belencito for the installation and initial operation of an extensive block making plant and sawmill equipment furnished by The Kent Company.

On his return trip Mr. Urban also visited Jamaica and Cuba in connection with export business.

Boost Output — — Slash Costs the SAUERMAN WAY!

Aggregate producers, cement, lime and gypsum mills and many processors of ores and chemicals find that jobs of handling materials can be simplified and big savings made by using either a Sauerman Cableway or a Sauerman Drag Scraper.

These machines are able to span a large area and move material rapidly from point to point anywhere within that area, dumping automatically at any required spot. The first cost of a Sauerman machine is reasonable, maintenance amounts to very little, and the simplicity of operation makes it possible to place the control of even the largest installation in the hands of one operator.

Almost any dig-and-haul project can be handled economically with the correct size and type of Sauerman machine. Tell us about your problem and you will receive, without obligation, advice based on the 42 years' experience of Sauerman engineers.

The Story Behind the Picture

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Using two 2-cu. yd. Crescent scrapers operating on long stockpiles at an angle from each other, the Sauerman scraper machine pictured above has given satisfaction since 1926 at the crushing plant of Wm. P. McDonald Corp. at Brooksville, Fla. Its 25-year record shows very small expense for repairs.

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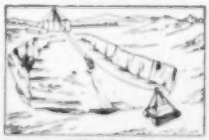

Sauerman Slackline Cableway

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lower processing costs

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- prevent blinding
- make it easier to meet specifications for fines
- eliminate cleaning labor
- eliminate screen wear due to cleaning abuse and extra weight of clogged screens.

Quick-Change Attachment for easy screen changes

- Distribution bars make direct contact with cloth eliminating current loss suffered when skirtboard is part of circuit . . . weak or broken circuits due to rusting.
- Distribution bars and insulations shielded from abrasion.

Write for Bulletin

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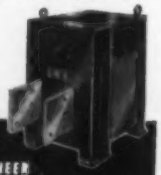

Hanco
THE PIONEER
ELECTRIC SCREEN HEATER

legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Recently the writer reviewed hundreds of higher court decisions and listed the outstanding law suits that can be used advantageously by readers and their lawyers in defending and winning similar unavoidable law suits. Readers should clip and file this article for further reference in the event legal controversies develop.

Lowest Best Bidder

During the last few weeks three contractors wrote me asking whether state or city officials can lawfully let contracts to a "high" bidder. The answer is: only when the low bidder has a bad past reputation for fulfilling his contracts, or when he has not sufficient equipment or financial means to complete his contract.

In the leading case of *Fetters v. Council of Wilmington* 73 Atl. (2d) 644, the testimony showed these facts: A city advertised for bids for a public works project. A copy of the plans and specifications was supplied to each bidder, with a clause that the city had the right "to reserve any and all bids". A city ordinance provides that installation contracts shall be let to the lowest and best bidder.

A contractor furnished the city a sealed bid for the proposed work. His bid was in full compliance with the plans and specifications and was accompanied by a certified check and a guaranteed performance bond. Some time afterward the contractor learned that the contract had been awarded to another "higher and best" bidder.

The contractor sued the city and proved that for a period of 30 years he had been engaged continuously and successfully in the business of contracting and had bid upon and completed numerous similar projects. The testimony showed that the contractor had an excellent reputation in the contracting field and had never defaulted upon a project awarded to him, and that he was in every way fully qualified to undertake

New and Better Diamond Bits for Modern High Speed Drilling

Always a leader in its field, Sprague and Henwood, Inc. has been working for a number of years on the development of new types of Diamond Bits, to supplement their well-known "TRUCAST" bits, which are still unsurpassed for many diamond drilling requirements.

NOW, after having been thoroughly proved by Sprague and Henwood's contract drilling crews, under every variety of drilling conditions, these new bits are available to other users. Two new types of "Powdered Metal" matrices; improved "Cast Metal" matrices; "Impregnated" coring bits; a new faster-cutting "Taper" bit for drilling blast holes in very hard rock —are all illustrated, described and tabulated in a new 16-page bulletin, No. 320. Write for it today if you can use it to advantage.

DRILLING MACHINES
and Accessory Equipment

To get the full benefit of our new diamond bits you need drilling machines with plenty of power and a wide range of both speed and feed. Model 40-C is our latest-model core-drilling machine and can be relied upon for best possible all-round results on holes up to 1000 feet in depth. Other modern machines provide for very deep core-drilling and for either core-drilling or blast-hole drilling underground. We also manufacture a complete line of improved accessory equipment. Illustrated bulletins containing detailed information mailed promptly.

CONTRACT DRILLING

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SPRAGUE & HENWOOD, Inc. Scranton 2, Pa.

See our four-page insert in the Mining Catalogs

and complete this project. Moreover, the city officials knew of the contractor's competency for completion of the project here involved. The higher court said:

"A reasonable man of experience in construction of this kind could not but have admitted, after proper investigation, that Fetters (contractor) was fully competent to discharge the responsibility entailed. With the knowledge on the part of the defendants (city) as to skill and competency of plaintiff to perform the work required; the action of the defendants (city) in awarding the contract to a higher bidder was taken in disregard of the defendants' duties to the taxpayers, and was a waste of public funds and was an act of favoritism in disregard of their duty and to the prejudice of the taxpayers."

Not Legal Debt

The higher courts hold that if a contractor performs work for a municipality, he is legally obligated to know that the municipality officials have proper authority to make the contract, and also that the city may lawfully pay the contract price; otherwise the contractor can recover no payment.

Recently a higher court laid down a new law that states statutes authorizing a municipality to sell bonds for construction of "additional sewers, pumps, and buildings" does *not* create a debt against the city, within the state's constitutional provision restricting a municipal debt.

This court also held that the funds essential to pay for a special sewage improvement may be raised either by an assessment on real estate specially benefited, or by a general tax on all the property located in the taxing district.

For instance, in *Department of Public Sanitation of City of Hammond et al. v. Solan*, 97 N. E. (2d) 495, the testimony showed facts as follows: The Sanitary District of a city adopted a resolution to sell bonds in the sum of $390,000, payable over a period of 30 years from a tax levy to be made annually by the city officials on property, real and personal, in the district. The proceeds from the sale of such bonds is to be used for the construction of intercepting and connecting sewers, pumps, and buildings.

Certain taxpayers filed suit contending that the state statutes authorizing the sale of these bonds for the public improvement *did* create a debt on the municipalities within the 2 percent constitutional limitation on indebtedness of municipalities.

The higher court refused to agree with this contention saying:

"In such case the tax or assessment is based upon the theory that it is a return for the benefit received by the persons who pay the tax or the property assessed. The bonds issued by the Board of Sanitary Commissioners under the law in controversy are not payable out of the general fund of the municipalities in question, but are payable out of a special fund to be raised by a special tax imposed as a benefit upon all the taxable property in the taxing district. It has been held frequently that

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Be sure that your equipment will continue to give the excellent service the manufacturer originally built into it. Take a tip from the machine makers. Replace with genuine Johns-Manville Friction Materials.

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INDUSTRIAL FRICTION MATERIALS
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similar debts are not debts of the governmental subdivisions."

Must Develop Lease

Modern higher courts consistently hold that if an operator holds a lease to remove sand and gravel or other deposits from public land, he is compelled to operate the whole area, to prevent cancellation of the lease.

For instance, in *Morley v. Berg*, 235 S. W. (2) 873, the testimony showed facts as follows: An operator named Berg obtained from the state officials a lease for taking sand and gravel from the beds and bars of a navigable river. For several years Berg operated a part of the area covered by the lease, but failed to take any sand or gravel from a certain 80-acre tract. The higher court approved the cancellation saying:

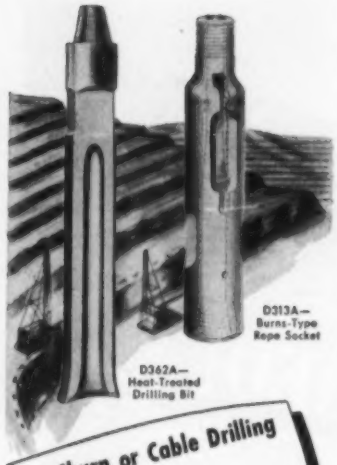
"In making an original lease the officials were under a duty to exercise reasonable judgment in fixing Berg's total area, neither granting so little as not to make Berg's investment for equipment worth while, nor granting so much as to be clearly beyond his capacity to develop the leasehold within a reasonable time. . . . But it does not follow that later events may not warrant a reconsideration of the area to be held exclusively by the lessee (Berg). We have often pointed out that since the principal considerations to the lessor is his expectation of receiving royalties, there is an implied obligation on the part of the lessee (Berg) to develop the entire property so that the lessor may obtain the expected income that induced him to grant the lease. . . . Certainly the lessee (Berg) could not justify the retention of undeveloped acreage merely to enable him to fend off competition in the market."

Meaning of Advance

A great deal of argument and many law suits have resulted in the past over the legal meaning of the term "advance" when used in lease contracts for sand-and-gravel land and real property.

For example, in *Vilbig et al. v. Gillette*, 238 S. W. (2d) 569, the testimony showed facts as follows: One Vilbig leased by a written contract with one Hanlon the right to excavate, remove, and sell gravel from 200 acres of land. The life of the contract was for a period of five years from its date. Vilbig agreed to enter upon the premises to mine and remove the gravel with reasonable diligence. As a consideration, Vilbig agreed to pay lessors (Hanlon) 15 cents per cubic yard for gravel. It was agreed that the term "gravel" meant all gravel and sand or mixtures of gravel, sand, clay, and other such substances mined, removed, and sold by lessee (Vilbig). As a part of the consideration, the contract further specified that "in event lessees during any month do not mine and remove from the premises a quantity of gravel sufficient to entitle lessors (Hanlon) to the sum of $300, then lessees nevertheless agree to pay lessors as a minimum monthly *advance* on royalty the sum of $300".

Thereafter the Hanlons sold and conveyed the said land to one Gillette, and at the same time the Hanlons likewise transferred and assigned to Gillette the said gravel lease contract.



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LARGE BITS for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

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for
• SHOT BLAST HOLES • WELL DRILLING
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In subsequent litigation the higher court held that the word "advance" in this contract meant that if Vilbig paid $900 during three months and removed only $400 worth of gravel at 15 cents per cubic yard, then Vilbig could remove $800 worth of gravel the following month and pay Gillette only $300.

Disability from Silicosis

Considerable discussion has arisen from time to time over this legal question: "On what date does an employee contract the disease silicosis for compensation award purposes?"

According to a late higher court decision the answer is: The date of injury in occupational diseases cases is the date upon which the employee first suffered disability and either knew or "in exercise of reasonable diligence" should have known, that the disability was caused by a present or prior employment.

For example, in *Argonaut Co. v. Industrial Acc. Commission et al.* 230 Pac. (2d) 637, it was shown that an employee had worked from June, 1923, to December, 1928, exposed to silica hazards. From December, 1928, to August 20, 1948, he engaged in other occupations which did not expose him to silica. In 1948 he quit work on account of the disability.

In subsequent litigation the higher court held that the employee contracted the disease in 1948. The court said:

"The commission made an award on November 23, 1950, finding that on November 23, 1948, Gonzalez sustained a *compensable injury* consisting of silicosis, which caused his death on April 9, 1949. Such a determination would not violate any constitutional right of any of the employers."

Earns More Money

According to a recent higher court, an employee who sustains a permanent injury while performing his regular work may receive compensation under the State Workmen's Compensation Act, although he earns more money after the injury than he earned previously.

For example, in *Northern States v. Industrial Commission*, 30 N. W. (2d) 217, it was shown that an employee sustained an injury while lifting heavy material. He was operated upon for this and a bone graft was placed on the spine. The healing period required 11 months. Soon afterward he was employed as a salesman at higher earnings than he made before the injury. The Industrial Commission awarded the employee permanent disability compensation. The case was appealed to the higher court on the argument that the salesman was entitled to no permanent disability payments because he now earns more money than he earned before the injury. The higher court approved the Commissioner's verdict and said:

"The court sustains the commission's finding that applicant (employee) was permanently and totally disabled from performing manual or other labor in his former employment."

Income Tax Deductions

According to a late higher court de-

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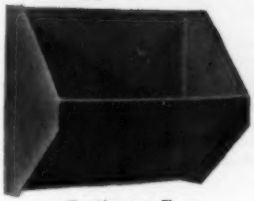

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cision Federal Income Tax deduction for expenses for back-filling land and all other like expenses must be made the year the expense is incurred, and *not* the year a reserve is set up to meet the expense.

For example, in *Paul Harrold v. Commissioner of Internal Revenue*, 16 T. C. 17, the testimony showed facts as follows: During the year 1945 and prior thereto partners, engaged in the mining of nonmetallic material from lands, filed the Federal Income Tax returns on the accrual basis.

At the end of 1945 the partnership estimated the cost of back-filling 31.09 acres to be $31,090, computed at the rate of $1,000 an acre, the cost of back-filling other lands. The partnership deducted from its gross income tax, filed in 1945, this sum of $31,090 for reserve back-filling expenses, although the back-filling was not done until 1946.

In 1951 the tax commissioner of the United States disallowed this deduction, saying:

"It is well settled that deductions may only be taken for the year in which the taxpayer's liability to pay becomes definite and certain."

For comparison, see *Atlas Mixed Mortar Company*, 23 B. T. A. 245. In this case, certain property was leased for the purpose of excavating sand and gravel deposits. A city ordinance required a permit and bond to cover cost of refilling any proposed excavation. The court said:

"The prudent business man often sets up reserves to cover contingent liabilities. But they are not allowable as deductions. . . ."

The importance of these tax holdings is this: A taxpayer has only three years to correct his Federal Income Tax returns. Therefore, these taxpayers lost their rights to make the deductions. In the first case, 16 T. C. 17, the deduction should have been made in the year 1946. After three years the taxpayer lost his right to correct his income tax return and therefore no deduction could be made for these expenses.

Vibration Disturbs Neighbors

A few days ago I received a letter from a reader as follows: "I purchased property in a business area in a city and intend to operate a vibrating concrete block machine. The building inspector has informed me that he will have an injunction issued against me. Can he do this?"

According to a late higher court decision the answer is yes.

For example, in *Saporti v. Zoning Board*, 78 Atl. (2d) 741, it was shown that one Saporti purchased property upon which he built an office and salesroom. In the rear, attached to the building, was another structure in which he installed a compressor for use in lettering monuments. The land and buildings are located in a business zone. The lettering of each monument required the use of the compressor for at least half an hour, and its operation caused a considerable amount of noise and vibration.

Persons residing near complained to

the building inspector. As a result of a warning from the inspector, Saporiti installed a rubber base under the compressor and attached a Maxim silencer. The complaints continued and the building inspector ordered the immediate cessation of the lettering operation because of the noise and vibration. The higher court approved the inspector's order saying:

"There was evidence that the noise made by the compressor was comparable to that made by a pavement breaker, and following the hearing it was determined by scientific methods that the operation of the compressor increased the noise and vibration in the immediate neighborhood by 3 percent."

Driver Deviates

Recently a higher court held that if a driver of a motor vehicle deviates from a short route to his destination, and an accident occurs, the employer is not liable, because the employee acts "outside the scope of his regular employment".

For example, in *Fitzgerald v. Wood*, 238 S. W. (2d) 103, the testimony showed that instead of taking a reasonably direct route to his employer's garage, the driver of a truck started off to get some barbecue sandwiches for himself. While enroute a serious accident occurred when the vehicle collided with a car, seriously injuring its driver, named Fitzgerald, who sued the truck owner for heavy damages.

In holding the truck owner not liable, the higher court explained that an employer is not liable for negligence of a truck driver who deviates from a short route unless there is some fact or circumstance indicating a benefit to the employer. On the other hand, the courts hold that if the facts indicate that the deviation enables the employee to arrive earlier or remain longer at his work, or to shorten the time of his absence for meals, or any other special benefit to the employer, then the court or jury may decide it to be within the scope of the employee's employment to deviate from the short route, with the result that the employer is liable for injuries caused by the driver.

For comparison—see *Gulla v. Straus*, 93 N.E. (2d) 662. One day an employer instructed Reynolds, a driver, to return the truck immediately to the garage after making a delivery of gravel. Reynolds failed to return the truck to the garage as directed, and several hours later the truck struck and severely injured a pedestrian.

In subsequent litigation the higher court refused to hold the employer liable in damages to the pedestrian, because Reynolds had exceeded the scope of his authority in failing to return the truck to the garage immediately as directed by his employer. The court said:

"No liability could be asserted against Straus (employer), because Reynolds had not only departed from the scope of the permission given him to operate the truck, but had violated specific instructions by Straus to return the truck to the garage."

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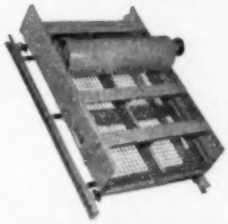

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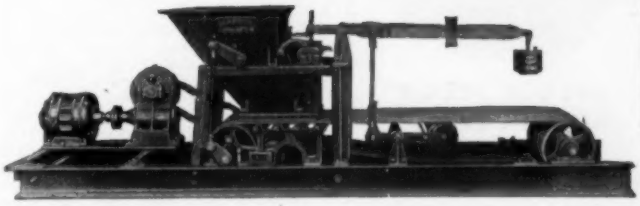

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CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 89106 (2)—Proposed to establish on sand and gravel, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply but not less than 30 tons, from Dickason Pit, Ind., to Brisbane, Joliet, and Matteson, Ill., 130 cents net ton.

Docket 89121—Proposed to establish a rate of 262 cents per net ton in open cars and 311 cents per net ton in closed cars on rip rap stone, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Bedford and Bloomington, Ind., district to Muskegon, Mich.

Docket 89127—Proposed to establish a rate of 25 cents per hundredweight on 15-ton minimum cars and 20 cents per hundredweight ton on 25-ton minimum cars on lime, common, hydrated, quick or slaked, straight or mixed carloads. When the carload charge based on the higher rate at actual weight (but not less than the minimum weight specified for the higher rate) exceeds the charge based on the lower rate at actual weight (but not less than the minimum weight specified for the lower rate) the latter charge will apply.

GENERAL FREIGHT TRAFFIC COMMITTEE EASTERN RAILROADS

Bulletin G-6465 (Shipper)—Proposed to establish a rate of $3.48 per net ton on limestone, natural, ground or pulverized, minimum weight 30 tons, from Buffalo, N. Y., to Detroit and Trenton, Mich., $3.48 per net ton, subject to ExParte 175 increase, not to apply via routes operating south of Lake Erie. Rates named herein will also apply on limestone, ground or pulverized, when containing not in excess of 3 percent of other minerals either physically or otherwise added.

Bulletin G-6466 (Carrier)—Proposed to establish rate of $5.41 per net ton on limestone, natural, ground or pulverized, unburned, in closed cars, minimum weight 30 tons, from Piqua, Ohio, to New Market, N. J. Subject to ExParte 175 increase. Rates named will also apply on limestone, ground or pulverized, when containing not in excess of 3 percent of other minerals either physically or otherwise added.

Bulletin G-6483 (Shipper)—It is proposed to establish on sand (except sand, molding, bonded, naturally or otherwise, and except ground or pulverized sand) and/or gravel, in open-top equipment, without tarpaulin or other protective covering, carload minimum weight 90 percent of marked capacity of car, from Corydon, Pa., to Tidioute and Tionesta, Pa., $1.46 per net ton. Subject to ExParte 175 increase.

Bulletin G-6484 (Shipper)—Proposed to establish on lime as described in Central Territory Railroads Tariff 516-L, from Mosher and Ste. Genevieve Mo., to

	Minimum 15 tons	Minimum 25 tons
Crane, Ind.	27	22
Fayette, Ind.	24	20

Subject to ExParte 175 increase. Rates in cents per hundredweight.

Docket G-6567—Proposed to cancel rate of $2.19 per net ton, subject to ExParte 175 increase on crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car from Plum Run, Ohio, to Gilbert Yard, W. Va., as published in N&W Tariff CF 7-E, ICC 9440, class rate or lowest combination to apply in lieu thereof.

Bulletin G-6576—Proposed to establish on magnesite, dead-burned, carload minimum weight 30 tons from Millville, W. Va., to Owensboro, Ky., 44 cents per 100 lb. Subject to ExParte 175 increase.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1191—Proposed to establish a rate of 101 cents per net ton on crushed stone, meeting specifications for bituminous concrete, having maximum gradation of not less than 95 percent pass-

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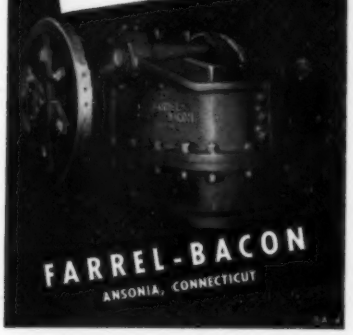

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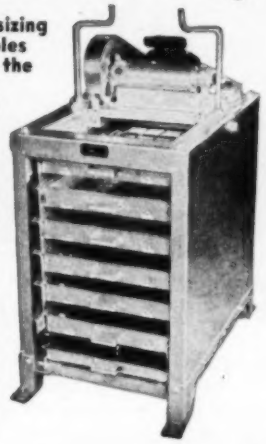

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ing 1-in. screen and not more than 10 percent passing No. 10 mesh screen from Lehigh, Ill., and 117 cents per net ton from Thornton, Ill., to Champaign, Ill. These rates are subject to ExParte 175 increase and will be subject to an expiration date of December 27, 1952.

Docket IRC 511-1196—Proposed to establish on stone, crushed, ground or pulverized, in closed equipment, minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full visible or cubical capacity, actual weight will apply, but not less than 30 tons from Ocoya, Ill., to Decatur, Ill. Present: class or combination rates apply. Proposed: 185 cents per ton of 2,000 lb., subject to X-175-B.

Docket IRC 511-1195—It is proposed to establish on stone, ground or pulverized, crushed or rough-quarried; also strippings of stone quarries, in straight or mixed carloads, in open-top cars not protected by tarpaulin or other protective coverings, minimum wegiht 90 percent of the marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply, but not less than 20 tons, from Prairie du Rocher, Ill., to Benton, Ill. Present: 139 cents per net ton, subject to X-175-B Missouri Pacific 7908-K. Proposed: 125 cents per net ton, subject to X-175-B.

NORTH PACIFIC COAST FREIGHT BUREAU AND PACIFIC SOUTH-COAST FREIGHT BUREAU

Docket JT-2181 (S)—Gypsum and gypsum products on flat cars—dunnage allowance—Sigurd, Utah, to Pacific Northwest covered by rates in DRGW tariff 4682-P. Request to establish, by exception to R-30 WC provision, that weight of dunnage will be added to and included in the tare weight of car.

Docket JT-2185 (S)—Request to establish on dolomite (roasted) and brick (fire and magnesite), carload, from Salinas, Calif., to Vancouver, B. C., rates same as applicable on mortar or cement (furnace or kiln lining or high-temperature bonding), i.e., 75 cents per hundredweight, subject to X-175, minimum 30 tons, item 5377-D Pacific Southcoast Freight Bureau 1-S.

PACIFIC SOUTHCOAST FREIGHT BUREAU

Docket 2400 (R/O) (S)—Request to reduce minimum weight on rock lime, carload, from Arrolime, Nev., to Kaiser and Fontana, Calif., minimum weight from 100,000 to 90,000 lb., applicable to rate in open-top cars not protected by tarpaulin or other protective covering.

Docket 3024 (S)—Request rate on rock, crushed, carload, from Los Angeles, Calif., to Idaho Falls, Idaho, 50 cents per hundredweight, not subject to X-175, minimum 50 tons.

DOCKET 3054 (S)—Request rate on limerock, in closed cars, carload, from Victorville to Culver City, Calif., 8½ cents per hundredweight, minimum 50 tons.

Docket (X) 3060 (S)—Proposed to establish on gypsum, crude, crushed, ground or powdered, carload, Winkelman to McNary, Ariz., alternate rates of 27 cents for a 40-ton car and 30 cents for a minimum of 20 tons.

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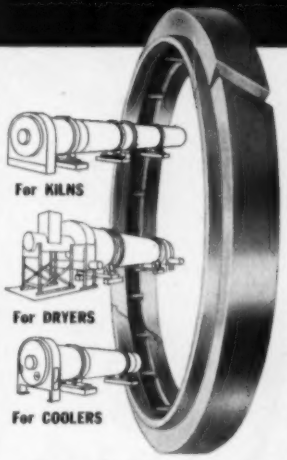

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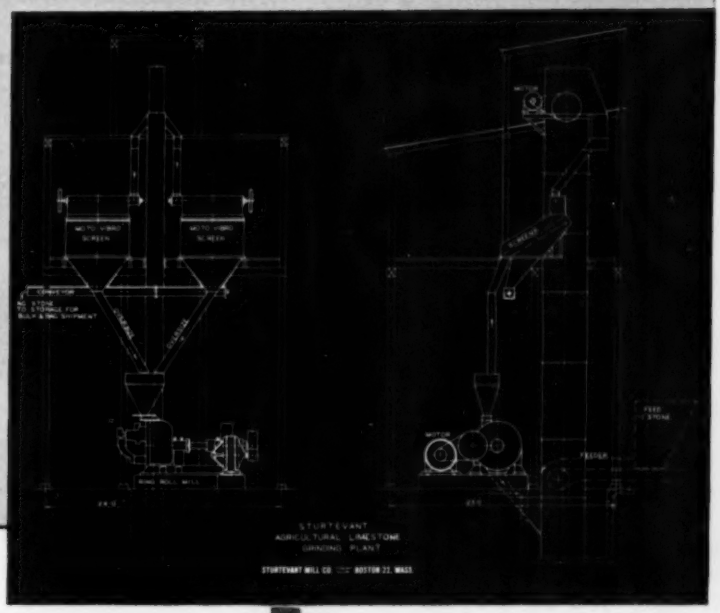

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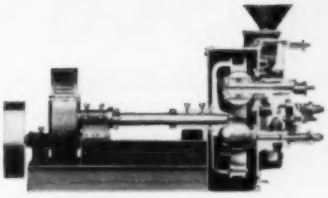

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Uniformly High Recovery: MULTICLONE's multiple *small diameter* tubes—made possible by its exclusive vane design—whirl the dirty gases with greater centrifugal force, thus throwing out not only the large, medium and small particles, but also a high percentage of the *extremely small* particles of 10 microns and less. This, coupled with the fact that there are no pads or filters to become choked with recovered material, results in a more complete recovery of *all* suspended materials from the gas stream.

Long and narrow

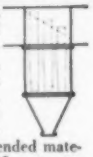
Maximum Adaptability: In addition to its unusual compactness, the MULTICLONE is also unusually adaptable to various installation requirements. Where head room is low it can be installed with side-inlet side-outlet connections. Where side clearances are restricted, it can be installed with side-inlet top-outlet connections. In addition, without changing capacities, the shape of the unit can be varied—long and narrow, short and wide, or square—to fit restricted spaces . . . and its single-inlet single-outlet duct requirements permit greater flexibility and simpler installation. These savings slice installation costs, space requirements and insulating expense.

Square

Space-Saving Compactness: Plant space costs money—so be sure to check space requirements carefully. As shown in the accompanying chart, the MULTICLONE requires less floor space and less cubic space than any other unit of comparable capacity and performance. Translate these savings into today's high costs for plant space and you readily see the great importance of this one MULTICLONE advantage alone!

Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

Minimum Maintenance: The MULTICLONE has no high speed moving parts to repair or replace... no pads or filters to clean or renew... nothing to choke the gas flow or increase draft losses as suspended materials are recovered. MULTICLONE draft losses remain uniformly low *at all times*. Further, the recovered material from an entire bank of tubes is collected in a *single* hopper—far easier to service and maintain than the multiple hoppers of conventional cyclone units.



FREE INFORMATIVE BOOKLET
This 32 page booklet outlines the basic principles of centrifugal dust recovery and shows the many ways MULTICLONE advantages assure higher recovery at lower overall costs. A free copy of this booklet will gladly be sent on request. Write today!

Before you decide on any recovery equipment be sure to get complete information on MULTICLONE advantages. A letter, wire or phone call to our nearest office places this information in your hands without obligation. Get all the facts and you will get MULTICLONE Collectors!

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ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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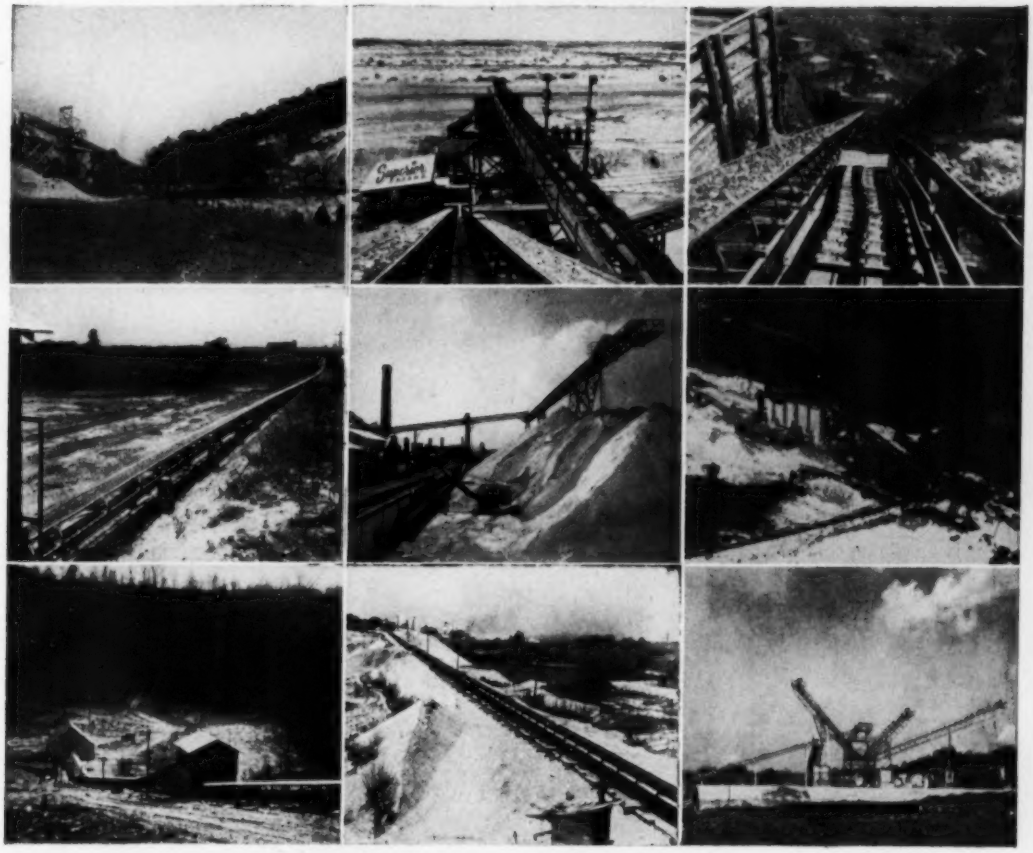
STONE HANDLING!

These are tough jobs—requiring sturdy equipment for long life and uninterrupted service.

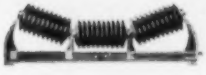
That's why these operators specified *Continental*



HEAVY DUTY IDLER

STANDARD DUTY IDLER

SELF-ALIGNING TROUGHING IDLER



RUBBER DISC IMPACT IDLER

OTHER PRODUCTS: Elevators, Feeders, Screw Conveyors, Pulleys, Trippers, Buckets, Sprockets, Takeups and Bearings.

CG-5002

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

SNAPPY swing
QUICK control
EASY operation
FINE balance

add up to accurate spotting of buckets with a BAY CITY

Whether you are loading bins and trucks or dumping on a spoil bank, the balanced design and easy flow of power of a BAY CITY will speed your materials handling and excavating operations . . . increase your profit possibilities.

With shovel, dragline or clamshell, the snappy swing, quick control, easy operation and fine balance of a BAY CITY make it easy to spot the bucket accurately and speed the digging cycle. No single factor makes the BAY CITY so long-wearing . . . so long lasting. It is a combination of heavy-duty design, construction and operating features which have made so many BAY CITY owners *repeat buyers* for up to 35 years. See your BAY CITY dealer for the full story or write today for catalog.

BAY CITY SHOVELS, INC.
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CHECK THESE FEATURES

- √ Fully Convertible
- √ Long, Wide Crawlers
- √ Alloy Cast Bases
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- √ Wide Vision Cab
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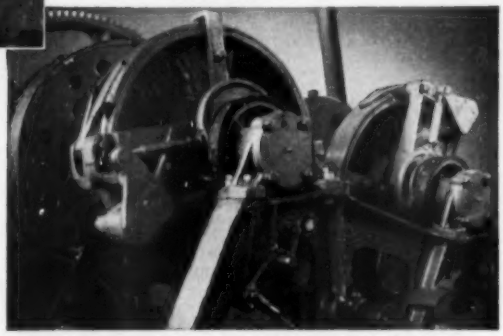
209

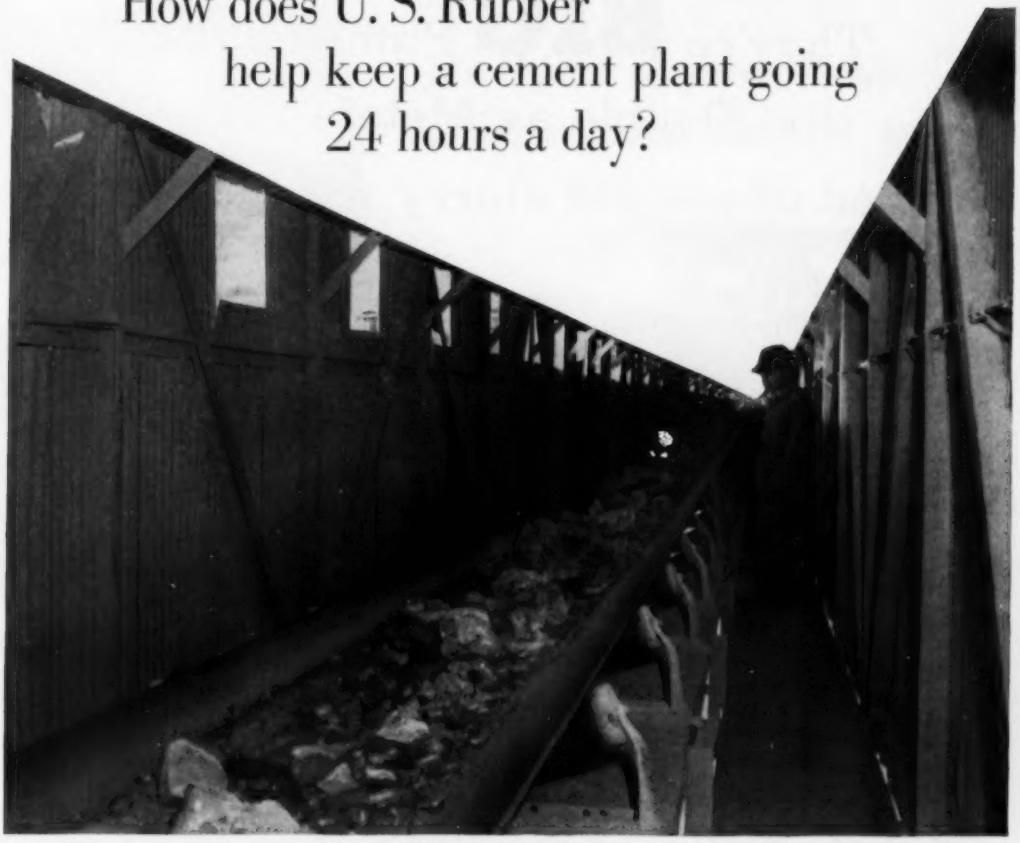
Power booster clutches—single adjustment ▶



BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

How does U. S. Rubber help keep a cement plant going 24 hours a day?



U. S. Rubber engineer inspecting belt. Inspection is a part of U. S. Rubber's continuous-servicing policy. View is looking down gallery to primary crusher.

(left) Overall view of cement plant, showing belt galleries connecting primary crusher plant (at right) with transfer house and mill.

U.S. Rubber conveyor belts are the lifeline of the plant. They help maintain the uninterrupted operation that is essential for the plant's economical production. These belts, as they carry the limestone from the pit to the kilns, withstand the abrasive action of the limestone all around the clock, seven days a week, handling 600 tons per hour.

"U.S." has always been a leader in materials handling. It will pay you to consult "U.S." engineers when you have a problem. Write to address below.

PRODUCT OF

U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

They're **BIG** Pumps that Double as Meters ahead of cement slurry mixing!

For handling underflow from Dorr thickeners, Missouri Portland Cement Co. uses two Dorrco Type W pumps. The easy, close adjustment of these pumps makes them ideal for controlling thickener underflow volume.

Here are two Dorrco Type W pumps with *extra capacity* — enough to recirculate underflow back to thickeners if necessary. And the close control provided by an adjustment handwheel, with calibrated stroke indicator, makes Dorrco Type W pumps excellent "meters" for controlling underflow volume from thickeners in any operation.

For your really big pumping jobs, check these advantages of the Dorrco Type W pump —

Big capacity — A 6" duplex (#6) will pump up to 30 cubic feet per minute while an 8" handles up to 75 cubic feet.

Stroke adjustment while running — Discharge rate can be varied within a 6 to 1 range *while pump is in operation*. An easy turn of the stroke adjustment handwheel does it.

Many mechanical advantages — Cranks and ball bearings replace power consuming eccentrics and low efficiency sleeve bearings. Lubrication is simplified by Oilite bushings and anti-friction, grease lubricated bearings throughout.

This is the information to have . . . Bulletin No. 5002 describes the Type W Pump in detail. For your copy, just drop a line to The Dorr Company, Barry Place, Stamford, Conn.

Better tools TODAY to meet tomorrow's demand

DORRCO

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WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

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Thermalloy "47" feed pipe and support pipe

Reduce down time and replacement costs

Specify

THERMALLOY

KILN PARTS

In scores of calcining operations, Thermalloy* has proved that it can materially reduce down time and replacement costs. This tough heat-resistant alloy was developed specifically to take heavy loads and rough usage . . . to resist corrosive gases, excessive heat (up to 2100°F) and abrasion. It is not just one alloy, but a *group* of alloys—each developed to meet a specific heat and abrasion problem.

For feed ends, feed pipe, kiln shell segments, grates and burner nozzles . . . investigate Thermalloy's superior heat and abrasion resistant properties. One of our sales engineers will gladly help you select the Thermalloy grade best suited to your application.

Call your nearest Electro-Alloys office, or write Electro-Alloys Division, 2040 Taylor Street, Elyria, Ohio.

Thermalloy "40" kiln feed end

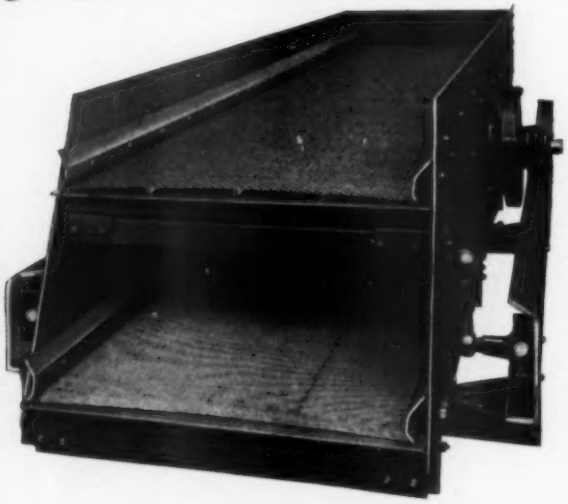
Segmental Design Kiln End: Kiln is protected by high heat-resistant Thermalloy to distance of 16½" back from mouth. Shield casting easily replaced by knocking out pins.

*Reg. U. S. Pat. Off

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

Talk About PURRformance



SMOOTH RUNNING SECO SCREENS PURR ALONG YEAR AFTER YEAR

We recently made a survey among a large number of the many operators whose Seco vibrating screens have been on the job *at least ten years.* The results of this polling of on-the-job performance on all types of screening assignments point out *one* important Secc advantage that should interest every profit-minded operator. This is smooth performance . . . and it's no accident. It's the direct result of Seco engineering. Only Seco with the patented equalizer assembly has fully controlled true circular action. That's why Seco vibrating screens run smoothly year after year . . . and smooth running screens last longer, with less maintenance. There's no bobbing, weaving or excess strain on moving parts. Yes, after all it's performance that counts. And if you want the benefits of smooth, trouble-free screening on your job, it will pay you to investigate Seco now! Write, wire or phone.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

THERE'S A SMOOTH-RUNNING SECO FOR EVERY SCREENING JOB FROM AG-LIME TO RIP RAP

Let Seco screening experts recommend the right screen or screens for your job. Over 350 models in single, double, triple and three and one half deck construction.

Screen Equipment Co., Inc.
1750 Walden Avenue
Buffalo 25, New York
In Canada: United Steel Corp.
Toronto, Ontario

You get that extra margin of endurance with

Thermoid

CONVEYOR BELTS • HOSE • MULTI V-BELTS

Whatever your business, you have applications that involve Conveyor Belts, Hose or V-Belts where these Thermoid products will do your job better—provide that extra margin of endurance that cuts costs.

Constant improvement and expansion of engineering and production facilities have always been part of Thermoid's program for the past 70 years. The results of this continuous program are rubber products that guarantee you high operating efficiency and superior performance . . . meet the demand for maximum service at minimum cost . . . last longer and require less maintenance.

When you have a design, production or operating application involving Conveyor Belts, Hose or Multi V-Belts, call your Thermoid distributor. In most cases, he can select the size and type that will serve your needs most efficiently. Thermoid Sales Engineers are always ready to help you with special problems.

It will pay you to specify Thermoid.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

"We Tripled Our Crushing Capacity with a KUE-KEN"

says California Operator

This Operator was using a Blake Type crusher. He then purchased a KUE-KEN, and at no increase in horsepower began crushing 3 times the tonnage per hour, at the same time producing a much greater percentage of fines.

This story is typical of those being experienced by purchasers of KUE-KEN all over the world. KUE-KEN, operating at 375 crushing strokes per minute, or 25 to 50% more than any other crusher, gives you the highest capacity crushing available today. Translated into terms of cost per ton this makes KUE-KEN easily the most economical crusher on the market. KUE-KEN's high speed means you get a finer, more uniform product, too . . . meet specifications easier.

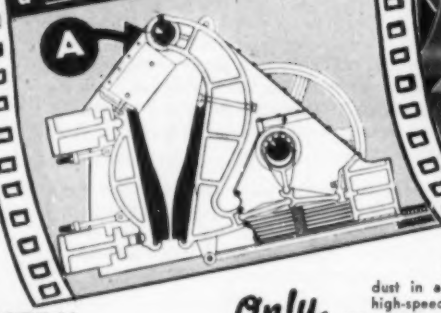
Here's why KUE-KEN's jaw plates outwear any other crusher's 5 times!

See how other jaw crushers act like giant grinding wheels . . . grinding away jaw plates with every stroke.

Moving jaw, driven by an overhead eccentric, forces rock both up and down causing severe rubbing and wear on jaw plates. Overhead Eccentric Type.

Unbalanced action of toggle-driven swing jaw imparts upward motion to rock, causing terrific abrasive action on jaw plates. Blake Type.

HERE'S KUE-KEN . . . with a new crushing principle!



A

Hinge pin is so located that jaw swings in a straight line without upward or downward motion. Rock is instantly gripped and crushed.

42" x 27" KUE-KEN. Capacity 250-350 tons per hour. Only 60 H.P. required. Wt. 30,495 lbs.

SELF-LUBRICATING

Only KUE-KEN seals all mechanism against dirt and dust in a "crankcase type" filtered oil bath to permit safe, high-speed long life operation.

Only **KUE-KEN crushes with firm direct strokes that practically eliminate jaw plate abrasion!**

WRITE FOR FACTUAL ILLUSTRATED DATA

STRAUB MFG. CO.

545 CHESTNUT ST. OAKLAND 20, CALIF.

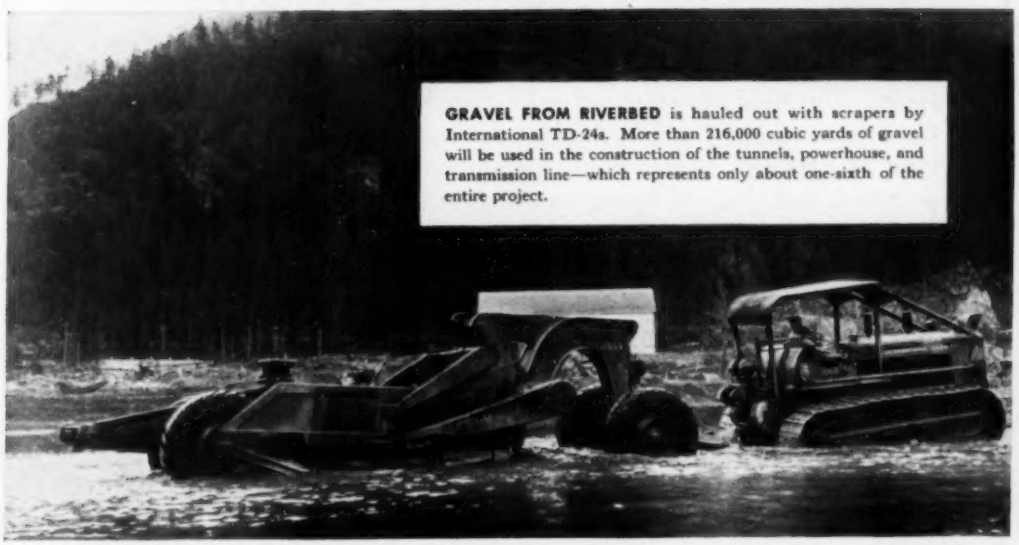
KUE-KEN Pronounced "Coo-Ken." U. S. and foreign patents pending.

DEALERS: LUND MACHINERY CO., Salt Lake City, Utah; CLOSNER EQUIPMENT CO., San Antonio, Texas; WASHINGTON MACHINERY & STORAGE CO., Seattle, Wash.; CONSTRUCTION EQUIPMENT CO., Spokane, Wash.; HEWITT ROBINS INC., Pasadena, Calif.; EDWARD L. KROPP CO., Portland, Ore.; CAL-ORE MACHINERY CO., Medford, Ore.; MILLER MACHINERY CO., Missoula, Mont.; ANAHUAC MACHINERY CO., Mexico City, Mexico; UNIVERSAL EQUIPMENT CO., Vancouver, B. C.

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor Broad and Arch Streets, Philadelphia, Pennsylvania.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., Authorized Licensed Manufacturer and Distributor Close Works, Gateshead-upon-Tyne, England.

Big Red TD-24 Pioneers New Frontier



GRAVEL FROM RIVERBED is hauled out with scrapers by International TD-24s. More than 216,000 cubic yards of gravel will be used in the construction of the tunnels, powerhouse, and transmission line—which represents only about one-sixth of the entire project.

59 "Big Red" International TD-24 crawler tractors spearhead largest integrated engineering program in history for Aluminum Company of Canada, Ltd., on Project British Columbia

A fleet of 59 hard-hitting International TD-24s is blazing a new frontier across 5,000 square miles of wilderness in British Columbia.

Here are some of the jobs the project includes, in an area that even now hasn't been completely mapped:

- **building the largest sloping clay core dam in the world**
- **driving a subway-size tunnel ten miles through a mountain**
- **blasting out an eight-story powerhouse two blocks long inside solid rock**
- **erecting a transmission line fifty miles long over a jagged mountain range**
- **raising the world's largest aluminum smelter and a new port city at Kitimat where 50,000 people may eventually live and work**

All rock, clay, and aggregates needed are available at the construction sites—and that's where the Big Red TD-24s really shine—in the quarry, the clay pits, and even dredging gravel from the icy rivers.

In fact, all over the project, veteran construction workers find that Internationals provide the muscle behind each engineering feat that keeps these far-flung operations going ahead like clockwork.

The big red machines with the IH trademark are known for good work. When you have a job to be done, get the facts on International Power from your International Industrial Distributor.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL INTERNATIONAL HARVESTER **POWER THAT PAYS**

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Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

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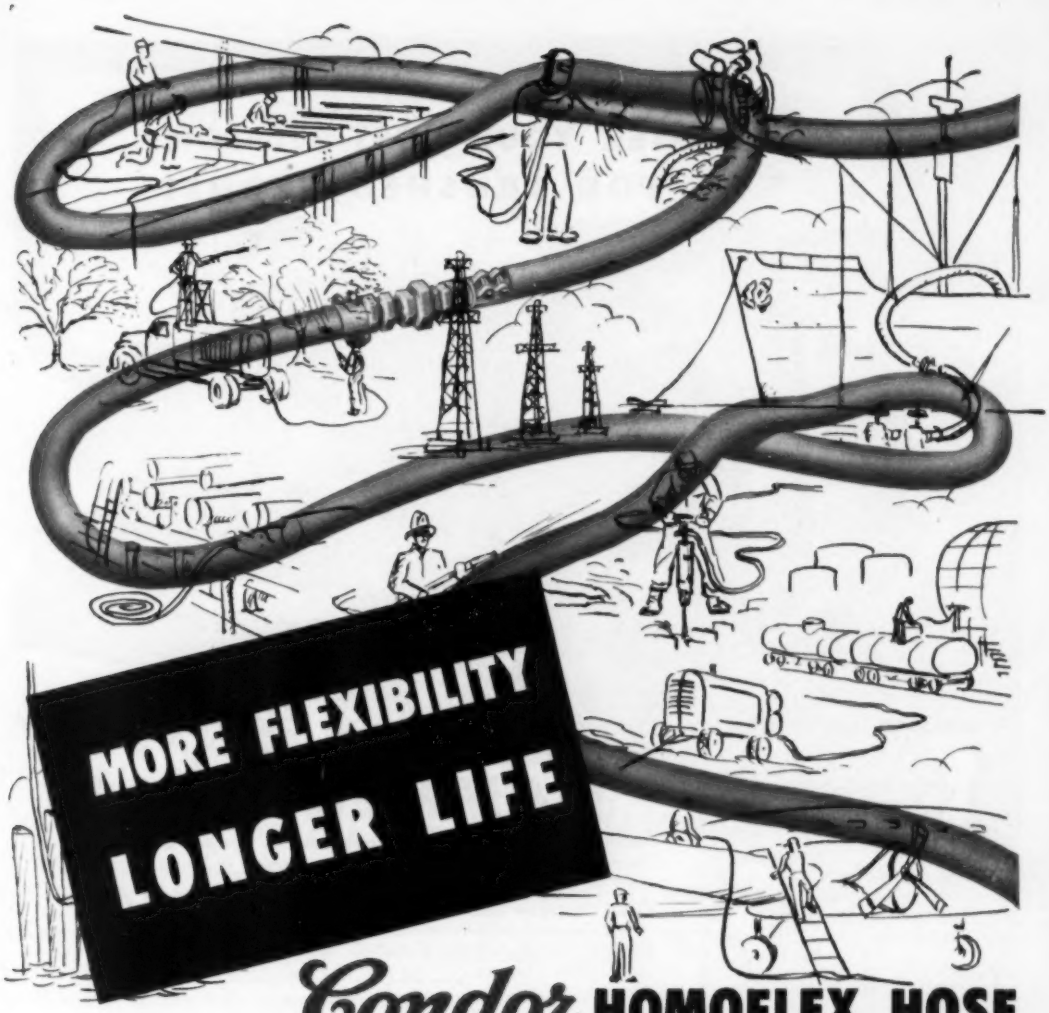


Condor HOMOFLEX HOSE

R/M engineers found a way to practically "homogenize" the wall of Homoflex Hose . . . By ingenious design, rubber tube and cover are blended together inseparably. The result, a hose wall with no pre-set twist, or stiffness. That's why Homoflex Hose is flexible as a rope, light and easy to coil and uncoil. Naturally, it lasts longer too. Made for air, water and other standard uses, Homoflex Hose has additional advantages described in Bulletin 6879D. Write for a copy • As the background suggests, Raybestos-Manhattan makes hose for every use. Your R/M Distributor will show you samples and discuss construction advantages.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

LOWER YOUR COST-PER-TON FOR CRUSHED STONE!

WILLIAMS *Heavy Duty* HAMMER MILLS

With a Williams, you don't need a primary crusher and another two or more secondary grinders — because *a single Williams Hammer Mill does the complete job in one operation!*

That means no additional machines are necessary — no extra foundations, housing, conveyors, drives or other equipment — *a saving up to 75% on initial investment!* And because a Williams does the job faster and better, you can *cut your crushing costs up to 50%!*

There's a Williams to suit *your* specific need, no matter what it is! It will pay you to *get the facts now!*

TYPICAL WILLIAMS HAMMER MILLS AND WHAT THEY CAN DO

SUPER-SLUGGER	Crushes power-shovel-loaded stone to 1½", ¾" — even to 8 mesh — in one operation! Capacities up to 550 tons per hour.
SLUGGER	Reduces 100-pound stone to 1½", ¾" or agstone — in one operation! Capacities up to 100 tons per hour.
NF and GA TYPES	Reduce 4" stone to ½", agstone — or as fine as 20 mesh — in one operation! Capacities up to 200 tons per hour.

OTHER WILLIAMS EQUIPMENT

ROLLER MILLS
— IMPACT and DRYER MILLS
— for fine grinding to 400 mesh or micron sizes

AIR SEPARATORS
— any type; for precision control and high production in fine grinding

VIBRATING SCREENS
— in any size for any job. 1 to 3 decks, open or enclosed.

HELIX-SEAL MILLS
— for dust-free grinding, and for wet, sticky, greasy materials.

Also: COMPLETE "Packaged" PLANTS for crushing, grinding, separating.

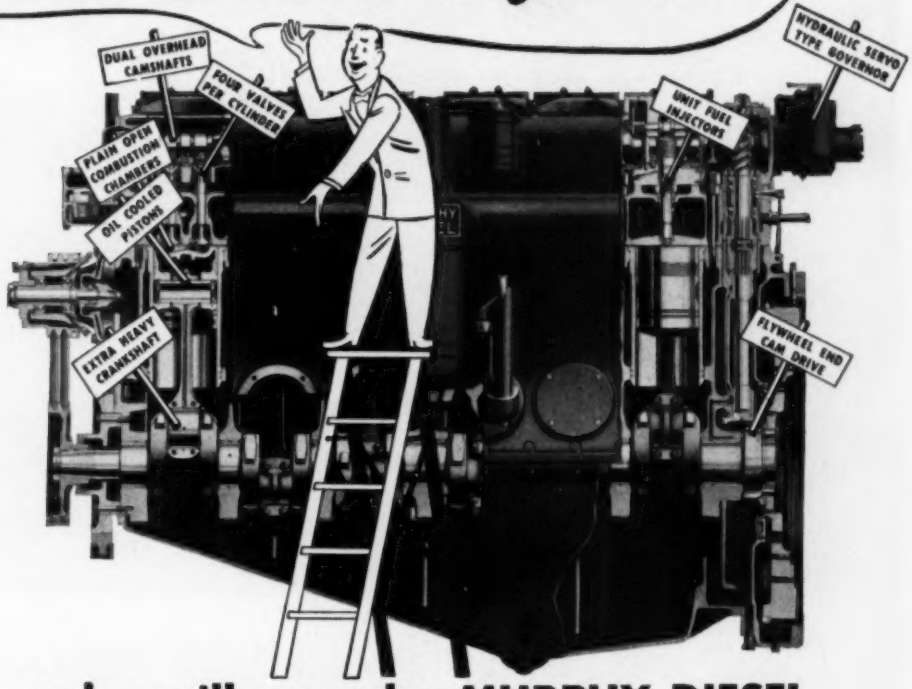
WILLIAMS PATENT CRUSHER AND PULVERIZER CO.
802 St. Louis Avenue — St. Louis 6, Mo.

WILLIAMS

CRUSHERS — GRINDERS — SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

Look inside the engine...



and you'll see why MURPHY DIESEL gives you more power, greater economy and longer engine life...

MURPHY DIESEL

Heavy duty power
for rock crushing

Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 226 H. P. 1200 and 1400 RPM. Generator Sets, 60 to 140 K. W.

FOR the most part, engines look pretty much alike from the outside, but to really judge an engine you have to look inside. The Murphy Diesel isn't afraid of comparison. It offers a combination of proved design advantages available in no other engine. Check these features for yourself and ask Murphy Diesel owners—they'll tell you what these features mean in terms of good heavy-duty power, minimum fuel consumption and long engine life.

Additional information is given in the booklet, *"10 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write direct.

MURPHY DIESEL COMPANY
5307 W. Burnham St., Milwaukee 14, Wisconsin
Tulsa Office—Sales, Parts and Service:
113-117 South Elwood Street, Tulsa, Oklahoma
Sales, Parts, Service

239

Crusher Jaws Rebuilt with Coast Metals Hard-Facing REMAIN ON THE JOB AFTER 8 YEARS

CM-112 Hard-Facing Welding Rod Increases Jaw Life Per Facing 4 to 1

A large southern mineral company has found the way to keep these crusher jaws on the job year after year. It rebuilds them with Coast Metals Alloy No. 112.

The jaws are used for crushing feldspar. They operate, on an average, 8 hours per day, and crush approximately 22,000 tons annually.

Despite the rugged nature of the operation they handle, and the volume of material processed, these jaws are giving as efficient service today as when they first went to work 8 years ago. Not only has over-all jaw life been greatly increased, but, with CM-112, working surfaces *need only be coated 3 times a year*—in contrast to 12 times previously.

Many other hard-surfacing materials have been tried by the mineral company, but results achieved by CM-112 have proved *outstanding*.

Let us show you how CM hard-facing alloys can meet your requirements. Whether it be bucket teeth, crusher teeth, muller tires, augers—or any other part that must withstand severe wear and tear—and you'll find coating with CM specialized weld rods results in *many times the production obtainable from unfaced units.*

So don't *replace—reface* with CM Alloys. You'll minimize downtime, slash maintenance costs, keep your production running smoothly, step up your output.

COAST METALS, Inc.

Little Ferry, N. J.

COAST METALS (CANADA), LTD., Hamilton, Ontario

PRODUCERS OF SPECIAL HARD-FACING ALLOYS FOR THE ROCK PRODUCTS INDUSTRY

"Motors Cleaner and Repair Costs Down"

say JAMES D. MORRISSEY, Inc., of Philadelphia

Eureka Quarries, Chalfont, Pa. Capacity 4000 tons daily.

Owner of 184 Trucks and 230 Pieces of Equipment Uses Only Sinclair Lubricants

James D. Morrissey, Inc. is one of the largest diversified operators in Pennsylvania.

This company operates the Eureka Quarries, Chalfont, Pa., whose capacity is 4,000 tons daily. It also owns and operates a large asphalt plant and has large construction interests.

Mr. Morrissey, who picks Sinclair Heavy Duty Lubricants for exclusive use in his 184 trucks and 230 pieces of equipment, says:

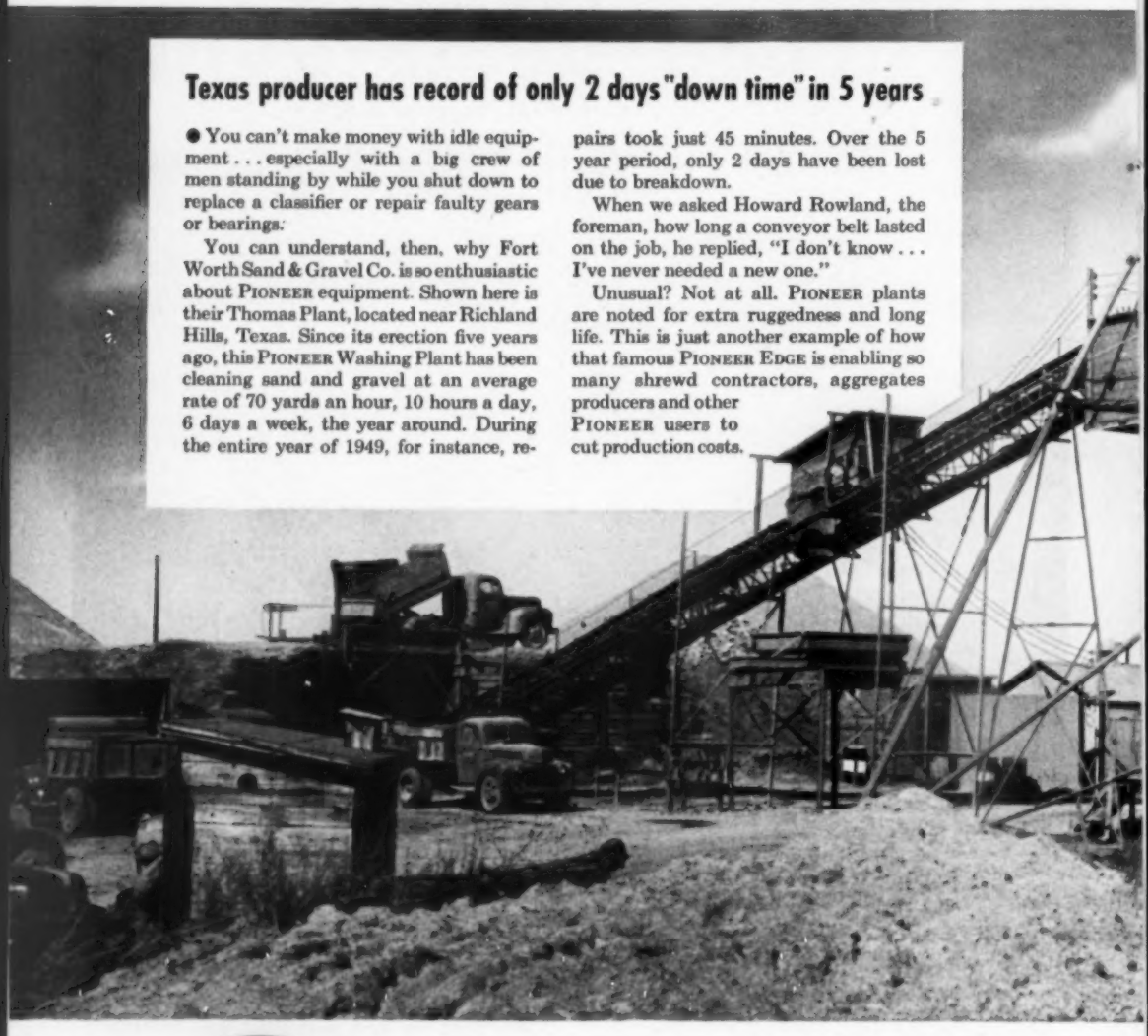
"Sinclair Heavy Duty Lubricants have proved themselves in two important ways. First, we've saved time and money by being able to standardize our lubricants. Second, we've reduced repair costs due to cleaner motors and lack of sludge accumulation, a problem in some types of our work."

Why don't you learn more about these outstanding heavy-duty lubricants? It will cost you nothing. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR HEAVY DUTY LUBRICANTS

When you can't afford "down time"

that Pioneer Edge



Texas producer has record of only 2 days "down time" in 5 years

● You can't make money with idle equipment . . . especially with a big crew of men standing by while you shut down to replace a classifier or repair faulty gears or bearings.

You can understand, then, why Fort Worth Sand & Gravel Co. is so enthusiastic about PIONEER equipment. Shown here is their Thomas Plant, located near Richland Hills, Texas. Since its erection five years ago, this PIONEER Washing Plant has been cleaning sand and gravel at an average rate of 70 yards an hour, 10 hours a day, 6 days a week, the year around. During the entire year of 1949, for instance, repairs took just 45 minutes. Over the 5 year period, only 2 days have been lost due to breakdown.

When we asked Howard Rowland, the foreman, how long a conveyor belt lasted on the job, he replied, "I don't know . . . I've never needed a new one."

Unusual? Not at all. PIONEER plants are noted for extra ruggedness and long life. This is just another example of how that famous PIONEER EDGE is enabling so many shrewd contractors, aggregates producers and other PIONEER users to cut production costs.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

keeps your plant going

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
(SUBSIDIARY OF POOR & COMPANY • CHICAGO)

● Please send information on the equipment checked.

- ☐ GRAVEL PLANTS
- ☐ ROCK PLANTS
- ☐ JAW CRUSHERS
- ☐ ROLL CRUSHERS
- ☐ WASHING PLANTS
- ☐ ORO FEEDERS
- ☐ BITUMINOUS PLANTS
- ☐ APRON FEEDERS
- ☐ MECHANICAL FEEDERS
- ☐ VIBRATING SCREENS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ CONTINUFLO CONVEYORS

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Two more Pioneer Plants guarantee Fort Worth Sand & Gravel Company low cost production.

"Kingsbury plant", installed 1949

"Britain plant", installed 1950

Bucyrus-Erie 6-Yd. 150-B

Sets New High Standards in Rock

Here are four of the most important reasons why —

BUCYRUS ERIE
SOUTH MILWAUKEE
WISCONSIN

Maximum Strength — Minimum Weight in this exclusive two-section shovel boom. Lower section, rigidly connected to the A-frame, has ample strength to take shock loads. There is no torsion in the tubular handle . . . it is free to rotate in the cylindrical saddle block. Independent rope crowd with crowd machinery on the main deck means low swing inertia and faster cycles.

Dual Twin Hoist Ropes provide steady, positive, digging action. Hoist power is automatically concentrated at the part of the dipper lip where it is most needed — power application that is unmatched for rock digging.

Quick-Action Propel — The 150-B's propel machinery can be quickly engaged for faster move-ups or for getting away from slides. Less time lost in moving pays off in higher output.

Heavy-Duty Construction means less downtime, lower maintenance costs. Larger, stronger lower works stand up to rough quarry duty. Box-section caterpillar treads have separate paths for rollers and driving tumblers. Treads stay in adjustment longer and resist wear better.

These big advantages, plus improved Ward-Leonard rotating variable voltage control, mean faster cycles and higher output in hard digging. In addition, the 150-B is readily convertible to independent-motor powered dragline service.

114L52C

● Digging and Loading Limestone in this Ohio quarry, the new 150-B is giving its owner topnotch performance. "We're obtaining very good results," he reports.

Low in First Cost!

FOR STONE PLANT OPERATORS

FOR SAND AND GRAVEL MEN

AERO-VIBE SCREENS

YOU'LL GET *profitable* fine screening with *Aero-Vibe* screens — low in first cost and low in operating cost! They're engineered to give you the same sturdiness and low maintenance that are typical of other Allis-Chalmers vibrating screens.

Aero-Vibe screens are so efficiently designed and so soundly built they've been operated successfully at speeds up to 2000 rpm! High speed gives you a spanking vibration that puts more fines through your screen — with less in the oversize. Vibration is easily adjustable. You just change the position of circular counterweights at shaft ends.

Find out how *Aero-Vibe* screens can save dollars in your operations. Call the A-C representative in your area, or write Allis-Chalmers, Milwaukee 1, Wisconsin, for *Aero-Vibe* screen Bulletin 07B6099. A-3798

Aero-Vibe screens are also profitable for sizing or rinsing medium-coarse materials up to 3-in. feed size. Built in 2 x 4 to 5 x 10-ft sizes, open or enclosed, 1 to 3 decks.

Aero-Vibe is an Allis-Chalmers trademark.

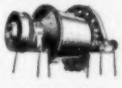
A-C ALLIS-CHALMERS

Hammermills

Vibrating Screens

Jaw Crushers

Gyratory Crushers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Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

"let's knock off, boys...

these are SUPER-TEMPERED PRECISION SPACE SCREENS"

Yes, these three trouble-makers know when they've had enough. They know that when Super-Tempered Precision Screens go on the job, it's time for them to hit the road.

Abrasion... Vibration... Fatigue—these are destructive forces that can upset your production schedules, cost you plenty in more downtime and more frequent screen replacement. But—not when you install Super-Tempered Precision Space Screens. And here are two good reasons why:

First: They stay tight because they're precision crimped and woven extra tightly on powerful hydraulic looms.

Second: They resist abrasion and fatigue because they're made of hard and tough super-tempered steel.

To order, write or phone our nearest sales office.

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THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta, Boston, Buffalo, Chicago
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SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
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MORE EFFECTIVE SHOTS

you can plan your shots better when you "Hook up and Detonate with PRIMACORD"

Using Primacord you get faster, easier loading; the positive firing of every dynamite cartridge in every hole – be they wet or dry; the shooting of as many holes as you wish; the most efficient use of your men and mobile equipment regardless of the terrain or the weather. And correctly hooked up, you can shoot the front holes a split second ahead of those behind, giving you relief from burden and better fragmentation. All of which means easier digging, larger daily yardage.

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Also Safety Fuse since 1836

There's a type for every job. **PLAIN PRIMACORD** for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep, ragged holes; and **PLASTIC REINFORCED PRIMACORD** for deep holes and unusual wet conditions.

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The PROVED and APPROVED DETONATING FUSE

This Lippmann GRIZZLY KING Jaw Crusher at Alabama Aggregate Company, Pelham, Alabama, has crushed 1,200,000 tons of tough Blue Ridge rock since it was installed. Discharge opening is 5 inches. The management reports that this tremendous output has been attained without interruptions — that the reversible jaw dies have not been touched, not even reversed.

No other jaw crusher can match GRIZZLY KING'S capacity and performance. Extra-long curved and reversible jaw dies, engineered crushing action with alloy steel frame and jaw add up to the rock-eatingest crusher on the market today. The GRIZZLY KING is the world's highest capacity overhead eccentric jaw crusher and is available in sizes up to 36″ x 48″ opening.

Other Lippmann equipment at Alabama Aggregate includes an apron feeder and discharge belt conveyor with Lippmann Life-Sealed Ball Bearing Idlers. Leading operators the world over choose Lippmann for their crushing, screening and washing plants both stationary and portable. It will pay *you* to do so too.

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The no. 1 choice from coast to coast!

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Hendrix Buckets May Be Special Ordered Without Perforations

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

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In every industry, from rock products to food to steel, Buell engineers, working with plant engineers, have established an enviable 18-year record of turning unnecessary dust losses into substantial new profits. What's more, Buell Dust Recovery Systems uncover, for all American industry, these additional important advantages: improved product quality, smoother plant-community relations and higher employee morale.

To take advantage of Buell's background and experience in the highly specialized science of dust recovery, ask for further information about Buell's **3 basic systems** of dust collection. See how they can help you turn dust into dollars. Send for Buell's new, informative bulletin titled, "The Collection and Recovery of Industrial Dusts." Buell Engineering Co., Dept. 18-K, 70 Pine Street, New York 5, New York.

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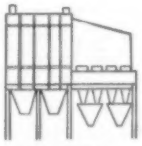
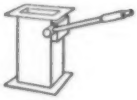


PRECIPITATOR—CYCLONE COMBINATION

TYPE 'LR' COLLECTOR



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ELECTRIC CYCLONIC

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ENGINEERED EFFICIENCY IN DUST RECOVERY

Here's higher production for your kiln!

BECAUSE they are *designed especially* for cement kiln hot zone linings, Permanente Periclase-Chrome refractory brick give you top performance, cut down on excessive replacements which rob you of valuable production time.

Verified performance records of kilns throughout the country show that Permanente Periclase-Chrome bricks have withstood as many as *17 shutdowns* for various causes *without any loss of brick due to spalling.*

With Permanente Periclase-Chrome brick you get a lining of maximum refractoriness with high resistance to chemical attack by cement clinker. It takes a good coating, holds it well, and has great resistance to thermal shock.

For more than 10 years, Kaiser Chemicals has been providing specialized brick to the cement industry. This experience is available to you—including installation assistance—at no extra cost.

STANDARD brick sizes supplied in both burned and chemically bonded forms. Recently expanded facilities enable us to better take care of your needs. Call or write principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

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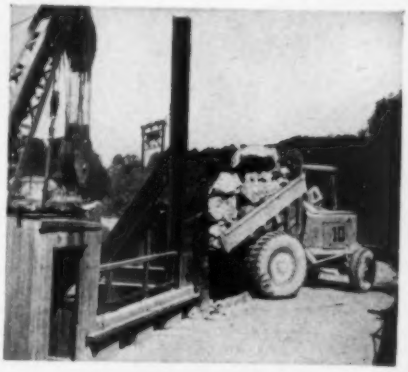
Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

GM DIESEL CASE HISTORY No. 5012-7

USER: The John T. Dyer Quarry Co., Birdsboro, Pa., producers of trap rock.

INSTALLATION: GM 4-71 Diesels powering 11 Koehring Dumptors. Six purchased in 1946, three more in 1948 and two in 1950. Dumptors gradually replaced railroad as quarry deepened and haul grades became too steep.

PERFORMANCE: Dumptors keep crusher operating at peak capacity 10 hours a day. Easily negotiate 7½ grade with 7½-ton load on 1400' haul. Engines have operated dependably with time out only for normal maintenance.



THIS DIESEL GETS UP GRADES FASTER

...and keeps coming back for more

It pays to Standardize on

GM
GENERAL MOTORS
DIESEL POWER

DETROIT DIESEL ENGINE DIVISION

'Round the clock operation at full capacity!

Norblo

automatic bag type arrester assures

dust control

for full production

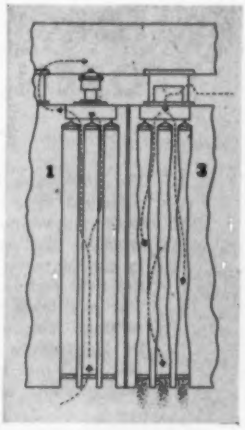
Continuous operation at full rated capacity — handling heavy dust loads by maintaining a constant suction drop across the arrester — is the performance that Norblo Equipment delivers every day in many types of plants. There is *no down time* with a Norblo Automatic Bag Type Arrester. Rugged construction, basic unit compartment and few moving parts combined in a fully functional coordinated design insure very high efficiency and low cost of operation and maintenance.

1. With 78 cylindrical bags per compartment all the cloth area of each bag is in active use and bags are kept fully distended by air moving upward inside the bags.

2. Variable timing of cleaning cycle according to dust load insures constant volume of air handled and of dust collected per square foot of cloth between cleaning cycles.

3. Shaking and cleaning involves only one compartment at a time. During this short period the vigorous reciprocating shaking and reversed air flow insures cleaning of bags.

4. Any compartment may be cut out of operation as long as desired for bag repair, on the clean air side, and all other compartments will remain in operation.



Norblo also builds centrifugal and hydraulic dust collectors, exhaust fans, cement air cooling systems, and portable type dust collectors. Write for literature on any of these.

THE NORTHERN BLOWER COMPANY

Engineered Dust Collection Systems for All Industries

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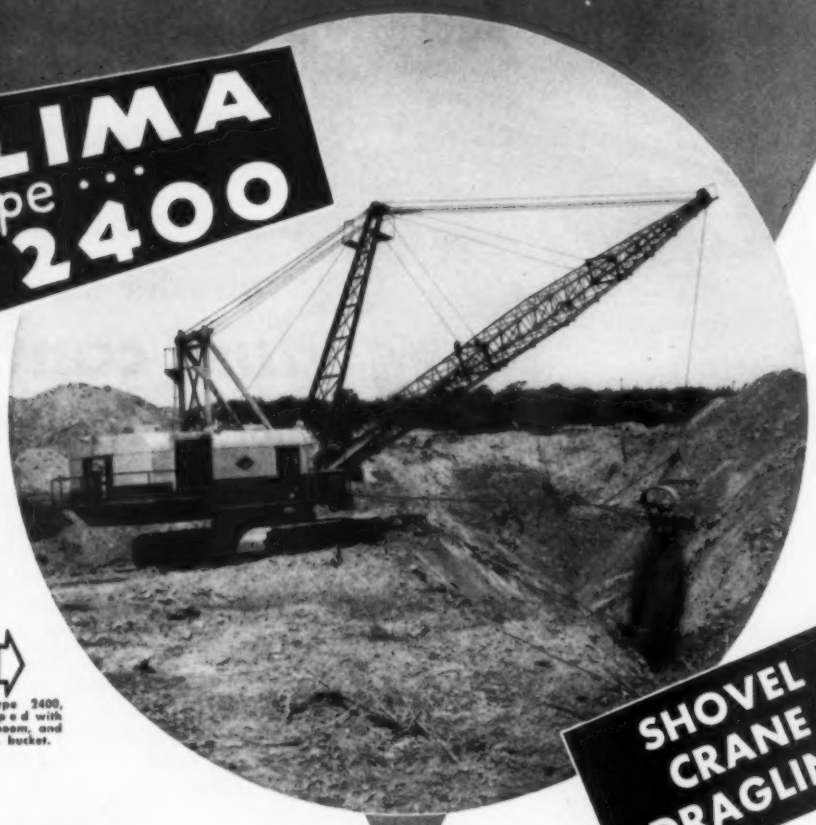
LIMA type ... 2400



Lima Type 2400, equipped with 120 ft. boom, and 6 cu. yd. bucket.

SHOVEL
CRANE
DRAGLINE

FOR
OPEN PIT MINING, QUARRIES and HEAVY CONSTRUCTION

The LIMA Type 2400 is a big, full mechanical clutch type shovel, dragline and crane with a combination of power, speed and stamina that gives complete satisfaction in all classes of work. It has been given the acid test for high output in rock and fast profitable operation in coal or metal mining. You will recognize at a glance, its heavy-duty engineering which means fewer delays on the job. You will like the smooth, efficient power that flows from its big husky diesel engine; the friction free drums and shafts that rotate on anti-friction bearings and the ease of control through air actuated clutches. These advantages and many more all add up to performance that pays off with fewer delays and bigger profits. You will like the Type 2400—6 yd. Shovel, 110 Ton Crane.

Baldwin-Lima-Hamilton Corporation
Construction Equipment Division
Lima, Ohio, U.S.A.

CAPACITIES: Shovels ¾ to 6 cu. yds. Cranes to 110 tons. Draglines, variable

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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

This F-8 BIG JOB mounts a 10-yd. Anthony dump body. There's a Ford Truck built to meet *your* requirements.

"I truck 12-ton loads of sand, yet my running costs are Only 3⅘¢ a mile"

says Charles Laws, Concord, California

"I've had experience with many makes of trucks," says Mr. Laws, "but none of them cost as little to run as my Ford. It saves gas and gives me more speed-hauling power, too." During the Economy Run, Mr. Laws' F-8 trucked 12-ton loads of washed sand 8,118 miles. Yet running expenses for gas, oil and service (but not including fixed expenses, such as, taxes, license, insurance, depreciation, etc.) totaled $297.59. That's a running cost of just 3⅘ cents a mile!

Two years of testing show how well the new Ford LOW-FRICTION engines perform under the most severe conditions. They passed scores of 100-hour "destruction" tests. One model alone ran as much as 50,000 dynamometer test-hours, over 500,000 vehicle test-miles.

Now! Up to 14% more Gas Savings

and more Speed Hauling power, too!

New LOW-FRICTION design in three Ford Truck engines means more miles per gallon. New direct-breathing OVERHEAD VALVES give more efficient fuel-feeding. New HIGH COMPRESSION offers more power on regular gas. Choose from 5 great engines: new 101-h.p. COST CLIPPER SIX; famous 106-h.p. V-8; proved 112-h.p. BIG SIX; two new CARGO KING V-8's developing 145 h.p. and 155 h.p.

DON'T GUESS! See how little it can cost to run a truck in your kind of work. See the cost figures in this 144-page book showing results from the 50-million-mile Ford Truck Economy Run. See it at your Ford Dealer's!

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Using latest registration data on 8,069,000 trucks, life insurance experts prove Ford Trucks last longer!

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Please send me without charge or obligation, complete details on the new Ford Trucks for '52 and the five great Ford Truck engines!

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Don't pin us down to that, please. But, no fooling, the twelve Bemis multiwall plants, strategically located coast to coast, mean that at least one is conveniently close to you. This time-saving means money-saving. Ask your Bemis Man for details.

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Manufacturers of Arcaloy stainless steel electrodes • Bronze-Arc phosphor bronze electrodes • Nickel-Arc and Nickel-Arc 60 electrodes for cast iron • Tool-Arc electrodes for tools and dies • Weld-Arc low hydrogen electrodes. Write for product Bulletins.

Singly or in combination, one or more of the many **Wear-Arc** hard-facing alloy electrodes will handle every known rebuilding and hard-facing problem. Why experiment... why depend on the unknown, the untested? For every application where wear patterns must be corrected to resist impact, abrasion, compression, heat, and corrosion... insist on genuine **Wear-Arc** Electrodes, one of Alloy Rods Company's six famous brands!

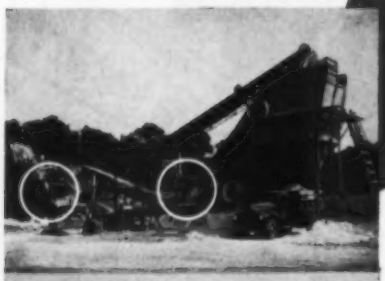
Wear-Arc 3 to build up carbon steel... **Wear-Arc 6** for heavy impact, abrasion, and compression... **Wear-Arc 40** and **Wear-Flame 40** for light impact and severe abrasion... **Wear-Arc A** and **Wear-Flame A** cobalt-chromium-tungsten type for light impact, wear resistance, heat, and corrosion ... **Wear-Arc B** and **Wear-Flame B** cobalt-chromium-tungsten type for heat, corrosion, and abrasion combined with impact... **Wear-Arc** and **Wear-Flame Tungsten Carbide** the ultimate in abrasion resistance.

AR-16

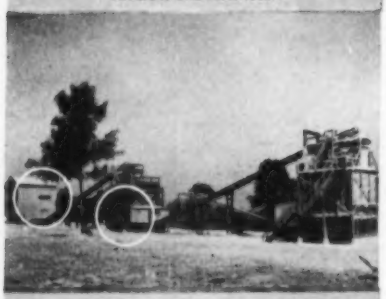
EDUCATIONAL FILM • Alloy Rods full color and sound motion picture, "No Finer Electrodes Made . . . Anywhere," 16 mm., available without charge . . . see how electrodes are made . . . write Department M.

There's EXTRA PRODUCTION

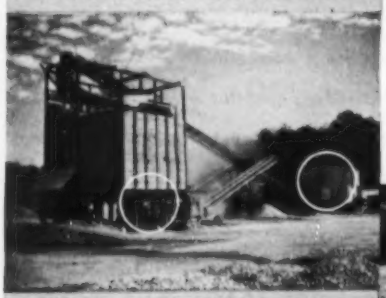
at 8 points in these four plants



SEMI-PORTABLE PLANT, producing agricultural limestone and road rock.



STATIONARY PLANT, producing agricultural limestone and several sizes of crushed rock.



STATIONARY PLANT, producing concrete aggregate, road rock and agricultural limestone.

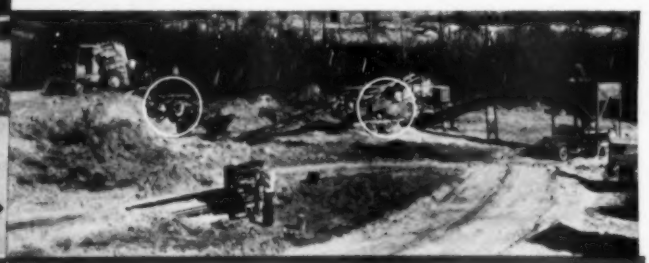
PORTABLE PLANT, crushing creek gravel for road surfacing.

8 A-W JAW CRUSHERS of various sizes

each with the

which puts an EXTRA amount of rock through a jaw crusher

Continuous operation and minimum maintenance expense are assured by the skilled engineering and sound manufacturing that characterizes every Austin-Western Crushing and Screening Plant. Each plant is designed to solve a particular production problem. We would welcome the opportunity to discuss yours.



Austin-Western
Crushing Equipment
LIMA Shovels and Cranes
Construction Equipment Division

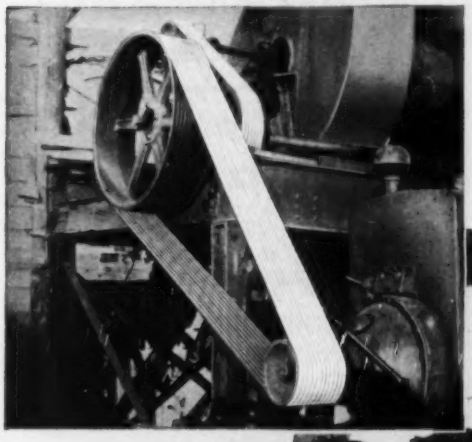
BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

How concave sides cut V-Belt costs

Important to anyone who wants to cut V-Belt replacement costs is the simple, interesting reason WHY Gates Vulco Ropes are built with *Concave Sides* (U. S. Patent 1813698). See Figure 1.

When a Gates belt is bent around a sheave these Concave Sides fill out to full, even contact with the sides of the sheave groove. (Figure 1A). This gives you sure pulling power. And, naturally, because wear is distributed evenly, the Concave Sides actually give you longer wear—longer belt life. That cuts V-Belt replacement costs.

On the other hand, when a straight sided V-Belt (Figure 2) is bent, the sides bulge out, preventing the belt from fitting evenly in the sheave groove. This causes *extra wear* at the points shown by arrows. (Figure 2A).



Make this simple test yourself...

Hold a straight sided V-Belt as it would be bent around a sheave. Take the sides of the belt between your finger and thumb. You can *feel* the bulges in the sides—the bulges that prevent an even fit in the sheave groove and cause extra wear.

Now do the same thing with a Gates Vulco Rope. You can feel the sides fill out. You can see why they press firmly and evenly against the sides of the sheave groove—giving you longer belt life—lower belt costs.

When you buy V-Belts be sure to get Gates Vulco Ropes—the V-Belts with the Concave Sides.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

SAVING $600 ANNUALLY

When these sand drying drums were flat belt driven, heat and dust reduced belt life to as little as two weeks.

The Gates Vulco Rope drives that replaced them are saving the Zigler-Cline Construction Co., Fayetteville, North Carolina, more than $600 annually.

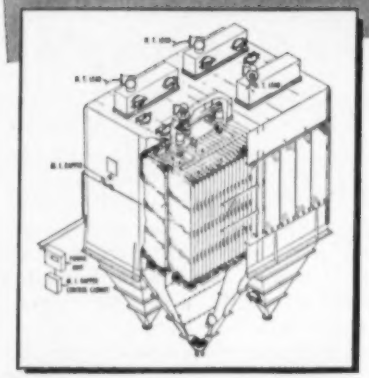
CS-526-B

Gates VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker of V-Belts

NEW!
COTTRELL M-I RAPPER
ELIMINATES ALL FOUR...



1. No more rapping puffs.
2. Automatic operation—conveniently located remote control panel provides complete control plus surveillance.
3. No dampers in inlet and outlet of precipitator are necessary.
4. No sections need be taken out of service for rapping.

HERE'S HOW IT WORKS: The new Research Corporation Magnetic Impulse Rapping System uses continuous, sequential, low intensity vibrations to keep thinner average coating on collecting electrodes. This method maintains optimum electrical conditions for continuous high efficiency dust collection. Ask your Research Corporation Field Engineer for complete data on this important new development, or write to us directly.

RESEARCH CORPORATION

405 Lexington Ave., New York 17, New York
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RC 141

Here's your BUCKET-SAVER BOOKLET

40 PAGES OF USABLE INFORMATION
including complete details about . . .

HOW TO SAVE YOUR BUCKET. Among the many "bucket saver" suggestions are a list of "do's" and don'ts" on the use and abuse of clamshell buckets; tips on how to prolong cable life; common operating mistakes that make bucket lips bow in or bend out.

HOW TO GET THE MOST FROM YOUR BUCKET. "How to Reeve the Bucket for Maximum Efficiency" is illustrated and described—One page is devoted to instructions for operators.

HOW TO REPAIR BUCKETS. Methods of renewing the cutting edges of worn bucket lips include special welding precautions. This section contains instructions for removing and replacing ball bearings in lever arm sheaves, lubrication instructions, and many other practical hints for care and maintenance.

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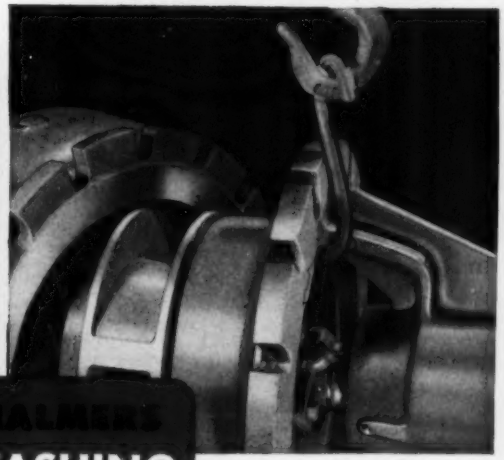

1. Disconnect drive, loosen casing bolts and lift bolt assembly from slot. Bolt, nut and washers are still connected for easy reassembly.

ALLIS-CHALMERS
COAL WASHING PUMP

2. Swing out rotating element. Neither suction nor discharge piping is disturbed. All wearing parts are fully accessible for inspection or servicing.

Back in Service in less than a Half Hour

ALLIS-CHALMERS
Coal Washing Pump

Only 5 Wearing Parts

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

YOU CAN SEE for yourself how quick and easy it is to service an Allis-Chalmers Solids Handling Pump. Fast servicing like this plus long runs between servicing keeps your pumping costs low.

You get long life from Allis-Chalmers Coal Washing Pumps, too, because they are made of special hard *Allisite* alloy . . . because they have thick sections and heavy parts throughout . . . and because they are application engineered by specialists who know coal washing problems and how to solve them. Allis-Chalmers can supply the complete pumping unit — pump, motor, drive and control — of matched components from one reliable source with one guarantee of satisfaction.

Get complete information on Allis-Chalmers Solids Handling Pumps from your nearest Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, asking for Bulletin 08B6381. A-3781

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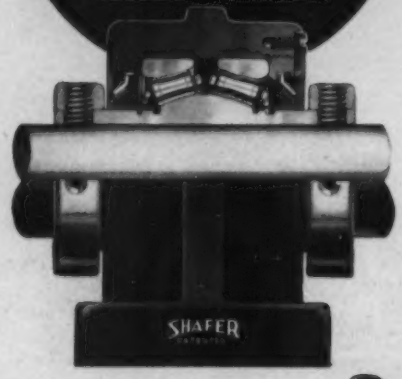

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November 1952

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On the 17 three-story and 12 seven-story units of Throgg's Neck Houses, the Contractor scheduled concreting to take full advantage of dependable 'INCOR' 24-hour stripping strengths. 'Incor' kept the job humming—carpenters, steel setters and mechanical trades (over 600 men) meshed their activities with assembly-line precision. First pour, April 1 . . . last pour, July 3 . . . 9 days rain . . . 152 floors concreted in 60 working days.

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The CONCRETE MANUFACTURER November 1952

Time For Action

THE response to our "Glamorize the Block" editorial has been predominantly favorable, but a few dissenting growls have drifted our way. These have mostly taken exception to our flat statement that concrete masonry "is still notably and surprisingly weak in the private residential building field."

We're not entirely sure whether the objectors actually disagree with our premise or merely resent the bluntness with which we called attention to a disturbing unbalance in the concrete masonry distribution picture. If they disagree, we hope they'll swamp us with statistics to prove we're wrong; if they just resent our abrupt way of stating an unpleasant truth, perhaps we can redeem ourselves to some extent by pointing out a remedy.

Although it seems almost impossible to establish the fact within narrow limits, we believe that concrete masonry accounts for considerably less than 5 percent of residential construction at the present time. This conclusion is supported in some measure by the results of an exterior material preference survey which one of the shelter magazines conducted recently among its 40,000 readers. Even though the questionnaire failed to distinguish between monolithic construction and masonry units, concrete wound up with only a little over 4 percent of the total votes.

If that doesn't jar our complacent block producer friends, perhaps another statistic from the same survey will do the trick: brick, unspecified as to type or kind, was the preference of over 32 percent of the young homemakers whose opinions were sought. We're not even actively engaged in the production of concrete block, and yet we get fighting mad every time we think of that survey, for no matter how you read it, it must be interpreted as a stinging, humiliating rebuke. Despite the concrete masonry industry's fine showing in practically every other branch of construction, it has neglected almost completely to sell its fine product to the general public.

We refer to neglect rather than failure because on a national scale the industry has done virtually nothing to promote its interests in one of the largest branches of the construction field. In view of this we think it is mildly astonishing that as many as 4 percent of prospective home builders even know that the product exists. How on earth, we wonder, did they ever manage to find out enough about concrete masonry units to acquire a preference for the material?

Our point, of course, is that if 4 percent of an important market can be captured with almost no effort at all, there is absolutely no telling what the results might be if an intelligent, all-out consumer merchandising program were launched on a national scale. Wherever such programs have been undertaken locally it has been convincingly demonstrated that concrete masonry, styled for exposed use in homes, has tremendous sales appeal.

From every conceivable point of view *now* is the time to undertake such a merchandising program: the industry is prosperous, and can easily afford to plow back some of its profits in expectation of greater returns; its physical facilities are in top-notch condition; and the demand for housing is almost certain to remain at its present high level for a number of years. We believe, in short, that the time has come for block makers to shelve their individual interests in favor of a program which will surely benefit the entire industry.

William M. Avery

news of the concrete industries

Lightweight Material Users Offered Aggregate Map Of Plants in United States

From 5 products and 80 plants in 1947 to 12 products and 220 plants in 1953 is the statistical record of the PIT AND QUARRY map of "Lightweight Aggregate Producing Plants in the United States".

Behind the phenomenal growth of the listings on the map is the equally astonishing development of the production and use of lightweight aggregate in the construction industry. Products which were little more than laboratory curiosities on the original map, are now leading aggregates in several fields.

The map is based on records that reflect the entire industry. Plant stories, trade association memberships, government and industry lists, and the PIT AND QUARRY DIRETORY OF THE NONMETALLIC MINERALS INDUSTRIES, have been studied and checked to obtain the list of plants shown on the map. It is believed that this is the most nearly complete and authoritative compilation ever made in this field.

Although covering the entire lightweight aggregate field, the map is so arranged that any type of material or the plants in any state or area can be readily located. It is expected that the producer of lightweight masonry units will find this map extremely valuable in locating the nearest source of any of the lightweight materials. Another value of the map is in showing the places that have abundant sources of supply and those that have few or none.

Lightweight block producers and other users of lightweight aggregates can obtain single copies of this map free by requesting a copy from THE CONCRETE MANUFACTURER, 431 S. Dearborn Street, Chicago 5, Ill.

Pipe Associations to Meet In Dallas February 25-28

According to an announcement issued by Howard F. Peckworth, managing director of the American Concrete Pipe Association, three meetings of interest to pipe manufacturers have been scheduled for February. The dates are as follows:

Fourth annual convention of the American Concrete Pressure Pipe Association, February 25; third annual convention of the American Concrete Agricultural Pipe Association, February 26; and 45th annual convention of the American Concrete Pipe Association. All sessions will be held at the Baker Hotel in Dallas, Tex.

According to word from W. C. Coupland, president of the National Concrete Products Association (of Canada), the dates of the fourth annual convention of this organization have been changed. As indicated in our Coming Events timetable, the convention will be held on February 9 and 10, 1953, and not, as given in the October issue on February 2 and 3.

Members of the Southeastern Region of N.C.M.A. will note that the headquarters of the meeting scheduled for November 24 and 25 in Miami Beach is *not* the Hotel Sherry Frontenac, as originally scheduled, but the Casablanca Hotel.

New Texas R.M.C. Assn. Names Lacy President, C. S. McLellan Director

Producers of ready mixed concrete in Texas, after meetings in Austin and Dallas, have organized the Texas Ready Mixed Concrete Association.

H. M. Lacy, Gifford-Hill & Company, was elected as the first president. Other officers are Lawrence Fuqua, Houston, and Scott Clark, Port Arthur, vice-presidents, and L. W. Dunn of the Fort Worth Sand & Gravel Company, secretary-treasurer. Directors elected were Thomas L. Amis, Dallas; J. E. Motheral, Austin; Weaver Cunningham, Odessa; Norman Fox, Harlingen; and R. J. Rayzor, Galveston.

An association office has been established at 907 Congress Avenue, Austin, Tex., with C. S. McLellan as executive director. Mr. McLellan for the last year has been executive director of the Texas Aggregates Association. He will serve as executive director of the two associations.

Coming Events

November 20-22, 1952—Chicago. Second annual Short Course, American Concrete Pipe Association. Sherman Hotel.

November 24 and 25, 1952—Miami Beach. Ninth annual Southeastern Regional Meeting, National Concrete Masonry Association. Casablanca Hotel.

January 14 and 15 1953—Milwaukee. 33rd annual convention, Wisconsin Concrete Products Association. Plankinton Hotel.

January 25-29, 1953 — Cleveland. 33rd annual convention and exhibit, National Concrete Masonry Association, Public Auditorium.

February 2 and 3, 1953—Toronto, Canada. Fourth annual convention, National Concrete Products Association (Canada). King Edward Hotel.

February 14, 1953 — Chicago. Annual convention and show, Mason Contractors' Association of America, Inc. Sherman Hotel.

February 16-19, 1953 — Boston. Annual convention, American Concrete Institute. Statler Hotel.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

February 25, 1953 — Dallas. Fourth annual convention and meeting, American Concrete Pressure Pipe Association. Baker Hotel.

February 26, 1953—Dallas. Third annual convention and meeting, American Concrete Agricultural Pipe Association. Baker Hotel.

February 26-28, 1953 — Dallas. 45th annual convention and meeting, American Concrete Pipe Association. Baker Hotel.

Theodore Leba Appointed Washington Representative By Directors of N.C.M.A.

On October 1 Theodore Leba, former chief structural engineer of the U. S. Coast Guard, assumed the duties of his new post as representative of the National Concrete Masonry Association in Washington, D. C. His appointment was approved by the N.C.M.A. board of directors last February.

Educated at Newark College of Engineering, New York University, Columbia University, and Purdue University, Mr. Leba is fully qualified for his new position. While serving as structural engineer with the Coast Guard, he conducted a private practice as structural design engineer on a part-time basis. (One of his projects was the structural design of the $1,500,000 addition to the Washington Sanitarium and Hospital at Tacoma Park, Md.)

Previously he had been similarly engaged with the Bureau of Plant Industries, Beltsville Research Center, Beltsville, Md., where his principal assignment was chief of design of the Atomic Research Laboratory and greenhouse specially designed for testing the effects of by-products of atomic fission on plants. Earlier positions in similar capacities were with the Veterans Administration, Construction Service, and the S '& W Construction Company, Memphis, Tenn.

Theodore Leba

During World War II Mr. Leba served with the Corps of Engineers as assistant engineer to the Engineer Office of the Alaska Defense Command. At this time he asssisted in coordinating a program for the development of military bases throughout Alaska. He is a registered professional engineer in Tennessee and in Washington, D. C., and is a member of the American Society of Civil Engineers.

Total U. S. Construction For September Steady— 3rd Qtr. Tops 1951 Figure

Expenditures for new construction throughout the nation in September totaled $3,112,000,000 about the same as in August, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Division, U. S. Department of Commerce. Dollar outlays exceeded the $3,000,000,000-mark for the third consecutive time in September, to round out the largest quarterly volume on record—$9,300,000,000, in contrast to $8,700,000,000 in the third quarter of 1951.

In most major construction categories, activity during September continued at high levels, which is usual for this time of year. Private expenditures totaled $2,037,000, and public $1,075,000.

Comparing the record volume for July-September, 1952, with that for the corresponding quarter 1951, private residential building and public utilities construction were higher, and private nonresidential building was lower—each by 9 percent. Private new construction activity as a whole was up by 3 percent. All major types of new public construction, except public housing, also showed an increase over the year; the entire public sector was 13 percent greater.

For the first 9 months combined, private expenditures this year, at $16,100,000,000, were slightly under last year's total. In contrast, public construction—totaling $8,100,000,000—was up by a fifth.

Filipino Firm to Manufacture Flexicore Roof, Floor Slabs

The Flexicore Company, Inc., Dayton, Ohio, has granted I. A. Marquez, Quezon City, Philippines Islands, an exclusive franchise to manufacture and market Flexicore precast floor and roof slabs in the Philippines. The announcement was made by Robert E. Smith, vice-president and manager of the Flexicore Co.

Construction of the new manufacturing plant, which will cost an estimated $150,000, has already begun. Mr. Marquez expects to produce 1,000,000 sq. ft. of Flexicore slabs annually.

Before contracting with Flexicore, Mr. Marquez made a personal investigation of both American and European precast methods and equipment. This included visits to several of the 14 Flexicore plants in the United States and a three-week study of the Dayton plant.

Georgia Concrete Block Firm Operating Third Plant

A third concrete block plant of the Atlanta Aggregate Company has recently begun operation; it is located in Marietta, Ga., approximately 15 miles northwest of Atlanta. The plant, equipped with modern machinery and equipment including the latest model Besser Super Vibrapac automatic block machine, has a capacity of 8,000 concrete blocks or equivalents per day.

Among the other major features of the new plant are a railroad car shaker; an 81-ft. radial stacking conveyor used to stockpile granite screenings and expanded slag over a 148-ft. reclaiming tunnel and conveyor system; a 1,000-bbl. cement silo; a 150-hp. steam generator unit; six steam-curing rooms; and large storage areas for curing and handling the masonry units.

S. E. Regional N.C.M.A. Meeting To Offer Varied Program

Members planning to attend the Southeastern Regional Meeting of the National Concrete Masonry Association at Miami Beach, Fla., on November 24 and 25 are assured of two (or three) profitable and enjoyable days.

Under "business" are listed meetings covering marketing operations, addresses on the various aspects of the concrete masonry industry, and inspection trips to several plants in the Tampa area.

Extra-curricular activities slated include fishing trips to the Keys on Sunday, November 23, golf, dog-track racing, swimming, tours of the city, and other assorted recreational features. All sessions will be held at the Hotel.

Russell J. Pellman has recently been appointed sales engineer for Permite concrete curing compounds for the Aluminum Industries, Inc., Cincinnati, Ohio. He was formerly a technical representative in the firm's paint and varnish division.

New Technical Publication On Making of Concrete Units

A technical manual recently published in the concrete products field is *Manufacture of Concrete Masonry Units* by William Grant, Chief, Bureau of Tests, Department of Buildings and Safety Engineering, Detroit. The handbook, written largely with the minimum of technical terms, presents a thorough treatment of the subject.

Major sections of the book include development of the concrete block industry; kinds of aggregates used; proportioning, mixing, processing, and curing methods; kilns; machinery and equipment used, including block-making machines, boilers, and motors; fuels; and block testing. The concluding section presents important technical notes, such as formulas and measurements. The 174-page manual contains 19 diagrams or graphs and 16 tables. It is published by Concrete Publishing Corporation, 400 W. Madison, Chicago, Ill.

The Raymond Concrete Pipe Company has opened a new office in Seattle, Wash. It is to be managed by Alf Hjort, Portland resident manager, who will continue to make his main headquarters in the Portland office. This is the sixth Raymond office serving the Pacific Coast.

Lewis Lloyd Named President At Perlite Institute Meeting

THE Perlite Institute named a new president and four other officers at its annual meeting, held in Minneapolis October 1 to 3. Representatives from 35 perlite producers in 20 states participated.

Lewis Lloyd, president of Alatex Construction Service, Inc., New Orleans, La., was elected president of the Institute for a two-year term. Mr. Lloyd, who took over the gavel from retiring President J. John Brouk of the Precast Slab and Tile Co., St. Louis, is the third president of the Institute since its formation in 1949. He is also vice-president and director of the National Concrete Masonry Association and vice-president of the Texas Concrete Masonry Association.

J. C. Kingsbury, vice-president, F. E. Schundler & Company, Inc., Joliet, Ill., was elected vice-president of the Institute, and three new members were named to the board of directors: Neal D. Snyder, Combined Metals Reduction Company, Salt Lake City, Utah; K. J. Bercaw, Great Lakes Carbon Corporation, New York City; and Kirk E. Hazelton, Cleveland Gypsum Company, Cleveland, Ohio.

In other official action, the board of directors approved the membership application of the MacArthur Company of St. Paul. Addition of this new member gives the Institute a total of 46 active perlite miners and expanders.

While discussion at the three-day meeting centered around perlite as a plaster and concrete aggregate, other technical information was reported on the use of the expanded volcanic rock as an additive to foundry sand and as an effective filter powder. Foundrymen in several sections of the country were reported to be getting good results in the use of expanded perlite as an additive to facing sand and core sand, and as an aggregate in the production of precast insulating risers. Because expanded perlite is bone dry, contains no gas-forming material, and has an extremely low linear expansion, it improves the permeability of foundry molds and eliminates many casting defects commonly caused by excessive moisture content and inadequate venting of gases.

Extremely fine perlite particles—once discarded by processors as unusable—are now being ground still finer and used by the dry cleaning industry as a filter powder for cleaning fluids, and in the distilling and oil refining industries as a filter aid.

A wealth of new data was released to Institute members by the technical committee on plaster and concrete. Each member company received a 126-page report on the physical properties of perlite concrete, as determined by the Robert W. Hunt Company, Engineers. The report makes available for the first time comprehensive load data for short span perlite concrete roof slabs made with a variety of different mixes; it describes such physical properties of perlite concrete as compressive and tensile strengths, thermal conductivity, drying rate, shrinkage, and plastic flow. While the report will not be released for general publication until proper technical interpretation has been made, it will enable Institute members to furnish architects, engineers, and building contractors with specific physical data on perlite concrete.

Lewis Lloyd

New thermal conductivity ratings for perlite plaster were also announced. Data determined by a nationally recognized laboratory showed the following "k" factors for perlite plaster, measured at 75° F.: scratch coat (2 cu. ft. of perlite to 100 lb. fibered gypsum), 0.857; brown coat (3 cu. ft. of perlite to 100 lb. fibered gypsum), 0.800. The same scratch and brown coats and a standard finish coat applied on ½-in. gypsum lath have a "k" value of 0.813. It was pointed out that these tests indicate that perlite-gypsum plaster provides from six to seven times the insulation value of standard plaster of the same thickness.

The Institute's Ore Committee reported that it is now preparing definite specifications to cover three distinct gradations of crude perlite rock which can be expanded in present-day furnaces to produce plaster and concrete aggregates conforming to Perlite Institute specifications.

The Halliburton Oil Well Cementing Company is building a new technical center at Duncan, Okla., W. R. McClendon, president, announced. The six-acre center will house the company's engineering, laboratory, and research facilities. Over 100 engineers, chemists, and other technical personnel will transfer to the center when it is completed in June, 1953.

Ohio Concrete Block Men Name Special Committee For Industry Research

The Columbus Concrete Block Manufacturer's Association of Columbus, Ohio, has appointed a special committee to study a state-wide research program for the industry and to report its recommendations at a coming meeting.

Named to the committee by President O. H. Seeger, general manager of Harry Wellnitz Company, are C. G. Cochran of Universal Concrete Pipe Company; Carl K. Dale, president of Al C. Dale and Son; and Robert G. Kern executive vice-president of Columbus Builder's Supply, Inc.

Mason Contractors' Assn. Schedules Annual Convention

Present-day construction problems and possible future construction business trends will be discussed at the 1953 convention of the Mason Contractor's Association of America, Inc., during the annual session, to be held at Chicago's Sherman Hotel February 1 through 4, 1953. The association will also put on its second industry exhibit.

According to William F. Nelson, president of M.C.A.A., the 1953 meeting will be "the most informative and extensive in the history of the mason contracting industry".

California R.M.C. Concern Renamed by New Proprietors

At Beaumont, Calif., Homer Vineyard and W. O. Grady recently assumed the ownership and management of the Beaumont Ready Mixed Concrete Company, formerly known as Mixed Concrete, Inc.

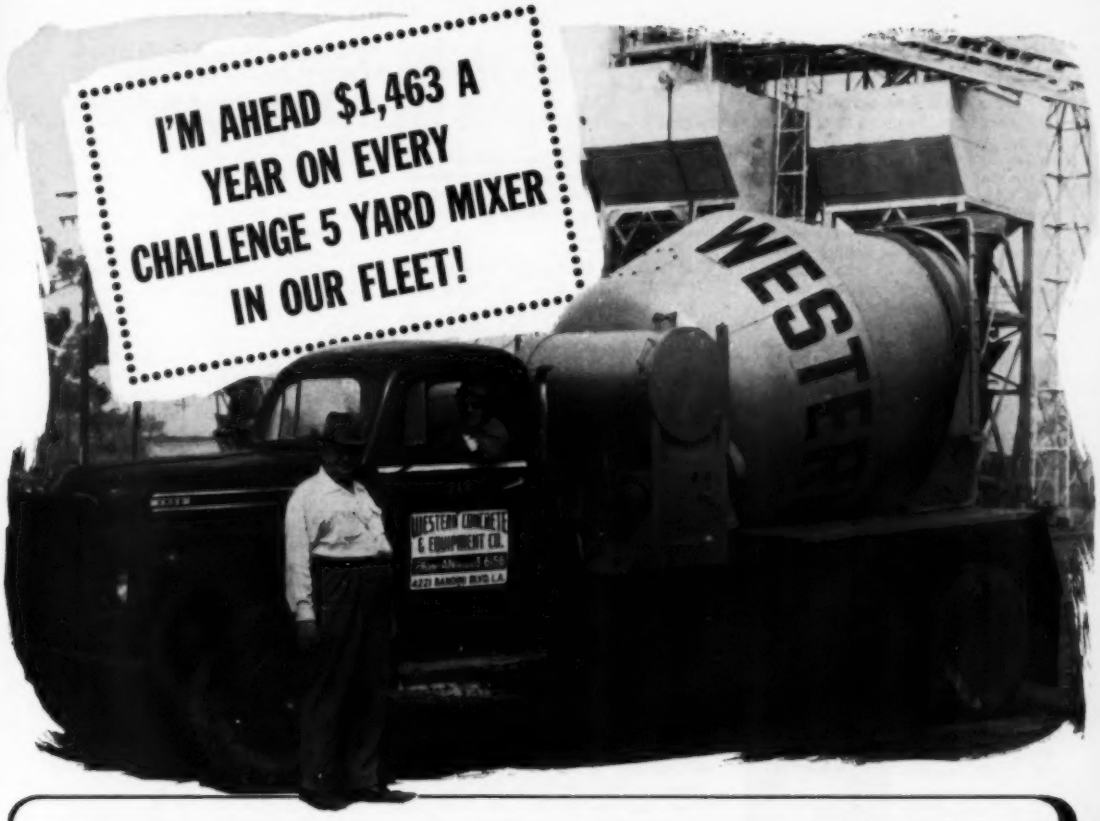
Both men are former employees of the Transit Mixed Concrete Company of Pasadena. Mr. Vineyard saw that firm grow from 6 to 13 operations during his 20-year term as superintendent. Mr. Grady was affiliated with Transit Mixed Concrete for 10 years.

We Salute "Voter's Guide"— A Fine Stearns Publication

A timely gesture of the Stearns Manufacturing Company deserves a hearty "Well done!" It is a "pocket dictionary of political terms and definitions", *The Voter's Guide*, published and distributed by Stearns in an effort to stimulate vote-consciousness among Americans.

Said Myron Hultmark, vice-president and general manager of Stearns, "We believe that with the co-operation of all interested Americans, the 1948 record (only 52 percent of the eligible voters actually took the trouble to exercise their voting privilege) can be greatly improved." The attractive, well-illustrated booklet covered such topics as forms of government, political terms, voting information, taxes, expenditures, debts, Congress, foreign policy, the Presidency, and related matters. One valuable section showed the only legal ways to mark a ballot. On the last page an election day tally sheet was provided!

I'M AHEAD $1,463 A YEAR ON EVERY CHALLENGE 5 YARD MIXER IN OUR FLEET!



So says Roy Walton, left, President, Western Concrete & Equipment Co., Los Angeles, Calif.

"That's the actual figure that showed up on the profit side of our ledger when we decided to make an item for item cost analysis of our truck mixer fleet . . . comparing our Challenge 5 Yard Mixers with other make 4½ yard mixers.

"We took everything into account, believe me! We worked out the initial equipment costs, maintenance and repair costs, and every other item of expense. We worked out in detail the actual cost to deliver a cubic yard of ready mixed concrete to the job site.

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- *our Challenge 5 yard mixers save 19c on every cubic yard of concrete delivered . . . 95c per load.**
- *figuring 7 loads per mixer per day, we save $6.65 per unit.*
- *in 220 working days per year, the extra profit for each Challenge 5 yard mixer in our fleet is $1,463."*

***Figures are based on rated mixer capacity. A comparison on overload remains the same for both mixers because drum volume is in accordance with TMMB standards.**

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Winners in 3 Sections Of R.M.C. Safety Contest For 1951-52 Announced

Winners in the National Ready Mixed Concrete Association safety contest ending June 30, 1952, have been announced by Vincent P. Ahearn, executive secretary of N.R.M.C.A. In Class A (companies producing more than 100,000 cu. yd. of concrete during the contest period) the winner was the Fischer Lime & Cement Company of Memphis, Tenn. This firm produced 156,592 cu. yd., worked 126,960 man-hours, and had no lost-time injuries. Moreover, there were no injuries to non-employees, and only two property damage accidents.

In the Class B competition (50,000 to 100,000 cu. yd.) the Morse Sand and Gravel Company, Inc., Attleboro, Mass., placed first, with 72,087 cu. yd. of concrete. The plant worked 79,500 man-hours, had no injuries to personnel or non-employees, and reported no property damage accidents.

Winner in the Class C. competition (under 50,000 cu. yd.) was Thomas, Bennett & Hunter, Inc., Westminster, Md. This plant produced 41,241 cu. yd. worked 51,795 man-hours, and had an accident-free record. All will be awarded PIT AND QUARRY Safety Trophies at the annual convention in San Francisco.

E. R. Mangotich Named to Post of N.C.M.A. Assistant Engineer

E. R. Mangotich

We regret that this photograph of E. R. Mangotich did not make the deadline for the October issue, which contained a news item announcing his appointment to the staff of the National Concrete Masonry Association.

Mr. Mangotich was named assistant engineer, to assist R. E. Copeland, director of engineering, in executing the N.C.M.A.'s expanding technical program. Before joining the Association he was engaged with several engineering projects and with the Vern E. Alden Company.

Duane D. Bryan Appointed To Post on San Xavier Staff

D. D. Bryan

Duane D. Bryan was recently named sales and advertising manager for the San Xavier Rock and Sand Company and San Xavier Materials, Inc., Tucson, Ariz., according to an announcement released by Edward O. Earl, president of the two firms.

Mr. Bryan was educated at Adrian College, Adrian, Mich., and holds a master's degree from the University of Michigan. He served as field director for the American National Red Cross during World War II at various Army and Navy air stations.

Before joining the San Xavier staff, Mr. Bryan was office sales manager and advertising manager for the Besser Manufacturing Company of Alpena, Mich., maker of the Super Vibrapac automatic block machine.

Capt. A. B. Maclay, Founder Of K. C. Firm, Dies of Polio

Captain Alfred Barmore Maclay, 27, secretary-treasurer of the Prestressed Concrete Corporation, Kansas City, Mo., died on May 23 in Letterman General Hospital in San Francisco, Calif.

Captain Maclay, who was recalled to active duty in March, 1951, and was serving as a jet pilot at Bergstrom Field at Austin, Tex. He was reportedly on a secret mission when he was stricken with polio. During World War II he was a fighter pilot in the European theatre, winning several decorations in 81 missions. Captain Maclay was one of the founders of the Prestressed Concrete Corporation in 1950.

Kenneth H. Talbot, 65, Authority on Concrete, Dies

Mr. Talbot was the owner of Superior Perlite and was secretary of the Central Arizona Concrete Association, which was formed last year.

In 1946 he directed the concrete installations for the atomic energy plant at Hanford, Wash. He was one of the engineers who designed and built the Parker Dam on the Colorado River, and was engaged in highway construction in Wisconsin and Nebraska. An army veteran of both world wars, Mr. Talbot was a retired lieutenant colonel.

Visitors See How It's Done At Tucson Plant's Open House

On October 18 the San Xavier Rock and Sand Company and San Xavier Materials, Inc., Tucson, Ariz., were hosts at an open house and barbecue.

Visitors inspected the new office building, constructed of San Xavier's "Lite-Wate" cinder block, and the new laboratory. They saw new block designs and watched the machinery as it turned out the various units. All that—and refreshments, too, of course.

Flexicore Slabs to Be Made By Alabama Cement Tile Co.

Flexicore precast concrete slabs for long-span, low-cost floor and roof construction are being manufactured in Alabama for the first time. A. E. Lloyd, president of the Alabama Cement Tile Company, has announced that his firm began production on September 15. He estimated that newly-expanded facilities in the company's Birmingham plant will allow annual production of 200,000 sq. ft. of precast slabs.

Slabs 8 by 16 in. in cross section and up to 26 ft. 8 in. in length will be produced. Allan Wingo will be in charge as manager of Alabama's new Flexicore division.

OPS Clarifies Application Of 4 Percent Increase To Dry Batched Materials

The Office of Price Stabilization has clarified the application of the 4 percent increase in ceiling prices to dry batched materials, as indicated in a communication from Vincent P. Ahearn, executive secretary of the National Ready Mixed Concrete Association.

In a message to N.R.M.C.A. members Mr. Ahearn stated: "You were advised . . . that OPS had issued an interpretation which made it clear that the authority to increase ceiling prices by 4 percent applied to dry batched materials. That interpretation was so expressed as to introduce uncertainty as to whether the authority to increase ceiling prices by 4 percent applied to dry batched materials delivered to job sites only. I co-operated with the Ready Mixed Concrete Association of Metropolitan Pittsburgh in getting an official statement from OPS on which the industry could rely.

"OPS disavowed any intention to limit the interpretation to dry batched materials delivered to job sites. It applied, said OPS, to all dry batched materials, whatever the point of delivery. That position was officially expressed in a letter to the Ready Mixed Concrete Association of Metropolitan Pittsburgh . . . "

Del DeLamater Appointed New GOCorp Sales Manager

Del DeLamater

Del DeLamater, who for the last four years was a sales distributor with Ted Merriam for GOCorp equipment in Michigan and parts of Indiana and Ohio, has recently been appointed general sales manager of GOCorp, Adrian, Mich., following the recent death of Mr. Merriam.

To serve in Mr. DeLamater's former area, GOCorp has transferred Elmer Hall from one of the firm's southern territories.

A corporation to produce large-diameter, high-strength steel tensioning units for prestressing of concrete has been formed. The new corporation is marketing bars of ½ in. to 1⅛ in. in diameter and up to 80 ft. in length, and their anchorages. They are based on the Lee-McCall patents of England. The new company, Stressteel Corporation, has its offices at 207 East 37 Street, New York 16, N. Y.

George W. Delitz, for 35 years a partner in a concrete block manufacturing business in Rochester, N. Y., died on September 7. He and his brother, John, operated the plant.

33rd Annual N.C.M.A. Convention Expected to Attract Record Crowd

PLANS are being made to care for record breaking attendance at the 33rd Annual Convention of the National Concrete Masonry Association. The convention, which has been growing every year, is combined with the 8th Biennial Concrete Industries Exposition this year, and provisions are being made for considerably more hotel and housing accommodations than for the previous record crowds of 1949 and 1951.

For four days the Cleveland Public Auditorium will be crammed with exhibits and sessions of the meeting. More than 61 exhibits are planned. They will present the latest developments in new equipment and it is expected that several basic design improvements will be shown for the first time. The exhibits now scheduled will show new products and materials; the latest methods and devices for handling aggregates and cement, and for mixing; improved devices for curing; concrete delivery equipment; improved block machinery; admixtures; glamorized blocks; and economical loading and delivery of products.

The convention, which will occupy the mornings of January 26-29, 1953, has been planned around a business session, a promotion session and two technical sessions. One of the features that has been arranged is a panel discussion under the chairmanship of A. G. Streblow, N.C.M.A. president. A six man panel, consisting of three block producers and three mason contractors, will go into the problems that confront them in the production and utilization of concrete masonry. It is expected that a better understanding of the problems that occur in the utilization of masonry units will result from this discussion and will spur producers to greater efforts to lend assistance to the masons in every way possible.

The promotion session will include the presentation of an important report from W. P. Markert, N.C.M.A. director of promotion. There will also be several addresses by leading experts in sales promotion and marketing, and question periods during which individual problems can be discussed. A new film on sales promotion techniques, widely praised by audiences that have seen it, will highlight the meeting. Ideas for enlarging the concrete products markets will also be presented.

The business session will feature the report of E. W. Dienhart, executive secretary of N.C.M.A. The committee reports will point out the progress of the association in numerous fields and will chart the future program for the industry.

Technical sessions will occupy the third and fourth mornings of the meeting. Among the features to be presented during this portion of the convention will be the report of N.C.M.A.'s director of engineering, R. E. Copeland; a discussion of good housekeeping around block plants; a detailed report on the building projects of the Corps of Engineers; and a tried and proved accident prevention program. A novel program, designed to be of particular interest to superintendents and foremen of block plants, will be a panel discussion and audience participation meeting in which a "Let's stump the experts" attitude will be encouraged. This is expected to produce some interesting and instructive discussion of production problems.

Other plans to add variety and life to the sessions include a pre-session musical program such as that introduced at the New York Convention, and a door prize for the "early bird" at each session. Entertainment plans have been laid for a "beer, pretzel and square dance", and the annual banquet featuring an entertaining floor show followed by dancing.

Convention officials have worked out a number of interesting programs for entertaining the ladies during the day. City, hotel, and Association officials are cooperating to make the affair bigger and better than ever.

*Exhibitors in the Exposition**

Solvay Sales Division, Allied Chemical & Dye Corp., New York, N. Y.
Bergen Machine & Tool Co., Nutley, N. J.
Besser Manufacturing Co., Alpena, Mich.
Blaw-Knox Company, Pittsburgh, Pa.
Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn.
L. Burmeister Company, Milwaukee, Wis.
Burns & Russell Co., Baltimore, Md.
Butler Bin Company, Waukesha, Wis.
Calcium Chloride Institute, Washington, D. C.
Dur-O-waL Division, Cedar Rapids Block Co., Cedar Rapids, Iowa
Celocrete Division, The Celotex Corporation, Chicago, Ill.
Chain Belt Company, Milwaukee, Wis.
Cleveland Vibrator Co., Cleveland, Ohio
Clipper Manufacturing Co., Kansas City, Mo.
Columbia Machine Works, Vancouver, Wash.
Concrete Magazine, Chicago, Ill.
Concrete Transport Mixer Co., St. Louis, Mo.
Construction Machinery Co., Waterloo, Iowa
Cook Bros. Equipment Co., Los Angeles, Calif.
Erickson Power Lift Trucks, Inc., Minneapolis, Minn.
Fleming Manufacturing Co., Cuba, Mo.
Flexicore Company, Inc., Dayton, Ohio
General Engines Co., Inc., Gloucester City, N. J.
Heltzel Steel Form & Iron Co., Warren, Ohio
Jaeger Machine Company, Columbus, Ohio
C. S. Johnson Co., Champaign, Ill.
J. A. Jones Concrete Machy. Co., Pittsburgh, Pa.
Kent Machine Company, Cuyahoga Falls, Ohio
Klingelhofer Machine Tool Co., Kenilworth, N. J.
Knickerbocker Company, Jackson, Mich.
Kwik-Mix Company, Port Washington, Wis.
Lith-I-Bar Company, Holland, Mich.
Littleford Bros., Inc., Cincinnati, Ohio.
J. F. Malane, Detroit, Mich.
Master Builders Company, Cleveland, Ohio
Maxon Construction Co., Dayton, Ohio
Medusa Portland Cement Co., Cleveland, Ohio
Memphis Equipment Co., Memphis, Tenn.
Multiplex Machinery Corp., Elmore, Ohio
Gene Olsen Corporation, Adrian, Mich.
Oswalt Engineering Service Corp., Forest Park, Ill.
PIT & QUARRY MAGAZINE, Chicago, Ill.
Portland Cement Association, Chicago, Ill.
Prime Mover Company, Muscatine, Iowa
Arthur Rehberger & Son, Inc., Newark, N. J.
Rock Edge Split Stone Products, Milwaukee, Wis.
Rock Products Magazine, Chicago, Ill.
Shore Engineering, New York, N. Y.
W. W. Sly Mfg. Company, Cleveland, Ohio.
T. L. Smith Company, Milwaukee, Wis.
Split Rock Products Co., Wauwatosa, Wis.
Spray-O-Bond Company, Milwaukee, Wis.
Standard Dry Wall Products Co., New Eagle, Pa.
Stearns Manufacturing Co., Adrian, Mich.
Towmotor Corporation, Cleveland, Ohio
Tracto-Lift Company, Kansas City, Mo.
Transmission & Gear Co., Dearborn, Mich.
Truax Machine & Tool Co., Seattle, Wash.
Universal Door Carrier, Inc., Indianapolis, Ind.
White Motor Company, Cleveland, Ohio.
Worthington Corporation, Plainfield, N.J.

*As of October 22, 1952.

At Greenwood, S. C., the Greenwood Concrete Company recently began operations in a new plant. The business is owned by George Lloyd of Anderson, S. C., and Sam Breen of Rock Hills, S. C., who operated similar plants in those cities.

Annual A.C.I. Regional Meeting Held During Centennial of Engineering

THIS year's annual regional meeting of the American Concrete Institute was held in Chicago on September 10, 11, and 12 in conjunction with the Centennial of Engineering celebration, which continued from September 3 through the 13. During this period approximately 40 national engineering societies held formal meetings in Chicago, with a combined registration approaching 25,000, the largest grouping of engineers ever held.

On Centennial Day, September 10, a luncheon was held in the ballroom of the Conrad Hilton Hotel, at which the two major awards for achievement in the engineering field were presented. The John Fritz medal was awarded to Benjamin F. Fairless, president of the U. S. Steel Corporation, and the Hoover medal was awarded to the Hon. C. D. Howe, Minister of Trade and Commerce in Canada.

Former President Herbert Hoover closed the ceremonies with an address which expressed confidence in the future of America under the private enterprise system. The same evening a dinner attended by several thousand was held at the International Amphitheater, at which Charles F. Kettering of General Motors was the speaker.

The technical discussions on September 11 and 12 were organized as joint sessions of the A.C.I. and the Structural Division of the American Society of Civil Engineers. The first day was devoted to reports on various applications of pre-stressed concrete; both morning and afternoon sessions were attended by approximately 1,000 persons.

The chairman of the morning session was A. E. Cummins, (Raymond Concrete Pile Company), chairman of the A.C.I. Committee on Pre-Stressed Concrete. In his welcoming remarks A. T. Goldbeck, Washington, D. C., president of A.C.I., mentioned the recent death of Harvey Whipple, long-time secretary of the Institute, who had been retired on a pension only last February after 31 years' service. He also mentioned the appointment of William A. Maples as acting secretary-treasurer of the Institute, succeeding F. F. Van Atta, resigned. The audience stood briefly in memory of Mr. Whipple, who had worked with many of those present.

The opening paper entitled *A Progress Report on Prestressed Concrete* was given by Professor Myle J. Holley Jr., Massachusetts Institute of Technology, who had served as chairman of the noteworthy Joint Conference on Prestressed Concrete held at Cambridge, Mass., in 1951. Professor Holley observed that linear pre-stressing had been utilized in approximately 100 structures built in this country in the last year, approximately two-thirds of which were bridges and one-third buildings. At least 30 factories are now furnishing pre-stressed members, all utilizing the post-tension method. A contribution to progress was a memorandum by the Bureau of Public Roads establishing criteria which included a requirement that steel in tension be grouted in place. Standard specifications for pre-stressing are being developed by a joint committee of the A.C.I. and A.S.C.E. Professor Holley concluded that although the practise of pre-stressing in this country has lagged behind that in other lands, rapid progress has been made here in the year since the Joint Conference.

The use of a very large number of pre-stressed stringers in the construction of Pier 57 in New York Harbor was reported by Captain E. H. Praeger, Madigan-Hyland Company, Long Island City. The economy of pre-stressing these members was proven by comparative bids for conventional pre-cast units. However, comparative bids for the much larger girders showed ordinary cast-in-place construction was cheaper. This result may have been due largely to lack of experience with such large units on the part of the contractors.

A. T. Goldbeck, president of A. C. I.

A series of papers reported experience in utilizing pre-stressing in a number of important structures, including the following: the Endicott Street bridge in Danvers, Mass., presented by J. C. Rundlett, Massachusetts Department of Public Work; the new Caracas La Guaira Highway, by Robert Shama Freyssinet Company, Inc., New York; the Tampa Bay bridge, by W. E. Dean, Florida State Road Department, Tallahassee; and girders in Manhattanville College, by Curzon Dobell, Preload Enterprises, Inc., New York.

The day's discussion of applications of pre-stressed concrete construction was summarized by Rear Admiral J. F. Jelley, chief, Bureau of Yards and Docks, who incidentally had been elected a director of the A.C.I. to fill a vacancy on the board. Adm. Jelley emphasized the need for improvement in design, as well as efficiency in mechanical handling, in order to realize the potential economies of pre-stressing.

During the second day of technical papers, which was also a joint affair of the A.C.I. and the A.S.C.E., the discussion was devoted to pre-cast and thin-shell construction. The chairman was Stewart Mitchell, California Division of Highways, and chairman of the Structural Division of A.S.C.E. A paper entitled *New Possibilities for Design of Shell Structures*, written by Pier Luigi Nervi consulting engineer, Rome, Italy, was interpreted and presented by Louis P. Corbetta, Corbetta Construction Company, New York. Mr. Nervi's first shell structure, built in 1939, had a clear span of 350 ft. He suggested that a span of 1,000 ft. was possible whenever such a structure is needed. He reported that his recent thin shells had shown savings over conventional designs of 30 percent in steel, 35 percent in concrete, and 60 percent in lumber. As for erecting such structures in the United States, Mr. Corbetta re-

(*Continued on page* 224)

Natl. Ready Mixed Concrete Assn. Holds Three-Day Directors' Meeting

By WALTER E. TRAUFFER

another ON THE SPOT moment

ANOTHER highly successful semi-annual meeting can be chalked up for the board of directors of the National Ready Mixed Concrete Association, which met September 29 to October 1, 1952, at the New Ocean House, Swampscott, Mass. A meeting of the board of the National Sand and Gravel Association was held at the same time, and the final day was devoted to a joint meeting. A total of 55 directors of both associations were present, and most of them brought their wives. Many important matters were discussed and many decisions were made which will affect not only the Association membership but the entire industry as well. This three-day meeting was all business, the only time out being on Tuesday, September 30, when nearly everyone attending went on a very interesting and scenic bus and boat trip to historic Salem and Gloucester, Mass. There was, of course, also special entertainment for the ladies. The meeting was blessed with excellent weather.

The meeting was opened with a brief address by President Richard K. Humphries (Pacific Coast Aggregates, Inc.), who, incidentally, is also chairman of the entertainment committee for the coming conventions of both associations in San Francisco. He promised to do everything possible to insure a pleasant and successful meeting and invited all producers to attend. The Association is in excellent condition, financially and otherwise, and 65 new active members have been added this year for a total of 550. There are also 5 new associate members, for a total of 71. While this membership is an all-time high and represents about two-thirds of the entire production of ready-mixed concrete it is felt that membership can and should be increased. Morgan R. Butler (Butler Bin Company), as chairman of the Manufacturers' Division, expressed the appreciation of his group for the courtesies and co-operation extended by the membership.

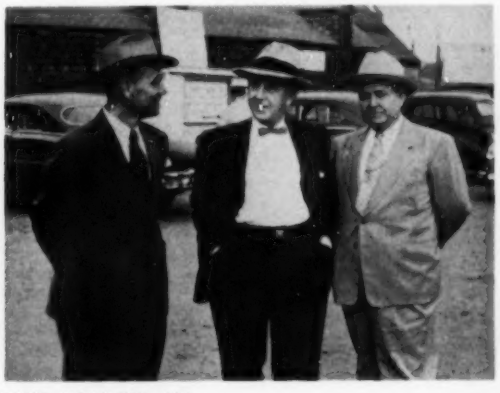
Convention Plans Considerable time was devoted to a discussion of plans for the coming convention, which will be held at the Fairmont Hotel, San Francisco, Calif., February 23-26, 1953. It was stated that the directors of both associations and as many producer members as possible will be assigned rooms at the Fairmont, and other members will be located at the other good and convenient hotels such as the Mark Hopkins, the Sir Francis Drake, etc. Most of the associate members will be located at the St. Francis Hotel, which is also very good but not quite so convenient. In place of the usual manufacturers' reception, a hospitality room will be open at the Fairmont every evening, where manufacturers and producers and their wives can gather. Arrangements will also be made to have lists of manufacturers' suite locations available as soon as possible. The policy against organized suite entertainment by manufacturers will be continued.

At the joint meeting John Smith of the United States Travel Agency described some of the special arrangements being made in connection with this convention, details of which are already in the hands of members. Briefly, a special train will leave from Chicago *via* the Grand Canyon for San Francisco, and on the return trip will go back through Coronado and Las Vegas, making all stopovers. Arrangements have also been made for a plane trip to Hawaii. It was announced that 62 had already signed up for the train and 16 for the Hawaii trip.

Going further into the future, the 1954 convention and exhibit are scheduled for the Conrad Hilton Hotel, Chicago; the 1955 convention will be in Miami. No definite commitments have yet been made for the 1956 convention and exhibit, and the date and place for the 1957 convention will be decided in San Francisco. Ray V. Warren (Western Pennsylvania Sand & Gravel Producers Association) invited both associations to meet in Pittsburgh in 1957.

The directors' meetings of both associations will be held September 28, 29, and 30, 1953, at the Broadmoor Hotel, Colorado Springs, Colo.

Mr. and Mrs. Joseph A. Bullen (Fountain Sand & Gravel Co., Pueblo, Colo.) and Mr. and Mrs. Morgan R. Butler (Butler Bin Co.).



Louis C. Schilling (I. E. Schilling Co., Miami, Fla.); Phil Gemmer (Texas Construction Material Co., Houston, Tex.); and Harold M. Lacy (Dallas Concrete Co., Dallas, Tex.).

Norman J. Fredericks (Koenig Coal & Supply Company) invited both boards to meet in 1954 at the Grand Hotel, Mackinac Island, Mich.

General details of the program at the San Francisco Convention were given. The directors' meetings of both associations will be held the afternoon of Sunday, September 22 and on Monday morning pending further information. The actual convention will start at 2:30 p. m., Monday, September 23, with a business session. As Sunday is Washington's birthday, Monday will be a legal holiday and many restaurants, night clubs, etc., are expected to be closed. Tuesday will be devoted to morning and afternoon meetings and there will be a joint luncheon at which the president of Stanford University will speak. On Wednesday there will be a plant tour by bus which will cross San Francisco Bay on the Dumbarton Bridge to various sand-and-gravel and ready-mixed-concrete plants in the Bay Area. The last stop on this tour will be the University of California campus. On Thursday there will be more meetings. On Friday and Saturday, for those interested, there will be a post-convention trip to Carmel and Pebble Beach, where there are several world-famous golf courses. In addition to the above there will be special entertainment for the ladies, including a luncheon on Monday, a bus tour on Wednesday which will include the Stanford University Campus, and a shopping tour on Thursday.

Present indications are that the manufacturers' exhibit at the 1954 convention at the Conrad Hilton Hotel in Chicago will exceed in size even the record show of 1952. The

Mr. and Mrs. Harry F. Thomson (Material Service Corporation, Chicago).

Hilton, it was reported, has considerably enlarged the exhibit space by making the former coffee shop space available for this purpose. It was suggested that the exhibit be kept open one evening during the meeting in order to give the operating personnel of plants in the Chicago area an opportunity to look over the machinery. Representatives of the Manufacturers' Division said they would be glad to co-operate if it is decided to do this.

Engineering Directors' Report Stanton Walker engineering director of both associations, gave separate reports before each group on individual problems and another at the joint meeting on problems affecting or of interest to both industries. He described the vast amount of work that had been done during the summer months on truck mixer tests on the University of Maryland campus. Much data is available on which progress reports will soon be issued, with a detailed report at the annual convention. A force of 22 men and a fleet of truck mixers including all types, were used and concrete ingredients were supplied from the plant of a local member producer. The work was done on a job-mix basis and the concrete was used to pave the parking lots at the university. All possible variations were made and all conceivable records were kept. One-half the cost was paid by the mixer manufacturers and the other half by the Association.

It was found that slow mixing is just as good as fast for any given number of revolutions provided that the time element does not allow the concrete to stiffen. Most of the tests were made with 4½-cu. yd. mixers, and speeds of up to 20 r.p.m. still gave good concrete. All of the mixers used, said Mr. Walker, made good concrete, but some required minor adjustments or alterations. It is of interest that no difference in quality of product was noticed when the mixers were loaded to rated capacity and when they were overloaded 10 percent. This, he said, means that present load limitations are too low, not that the mixers can be safely overloaded. Throughout the tests conditions were kept on the unfavorable side, so that the results obtained will be universally applicable. Mr. Walker believes that these tests should be carried further next year, and he suggested permanent arrangements so that any future new models can be tested. The joint resolutions committee agreed to ask for funds for further tests.

At the joint meeting Mr. Walker described some of the activities of the joint research laboratory, including tests of crushed sand; heavy-media processing; effect of size of aggregate, consistency of concrete, cement content on air and water quantities; bituminous mixture studies, including immersion compression testing and different methods of stability testing; flexural strength studies; admixture tests, including fly ash and volcanic ash; fire tests; temperature of curing; comparisons of freezing-and-thawing testing methods; studies of cylinder molds; reproductibility of air test; etc. He also told of the vast amount of work he and Mr. Blum are doing in conjunction with various technical and industry bodies such as the A. S. T. M., the Highway Research Board, the American Association of Railways, etc. This work, combined with attendance at many regional meetings and at the growing number of short courses, is taking a large part of staff time.

The present contract with the University of Maryland for the joint

One of the two boatloads of conventioneers sailing through the lobster pots.

research laboratory of the two associations expires on January 1, 1953. This contract was for two years and was self-renewing. The new contract now before the board of regents of the University, said Mr. Walker is for five years and is self-renewing with a 2-year notice clause.

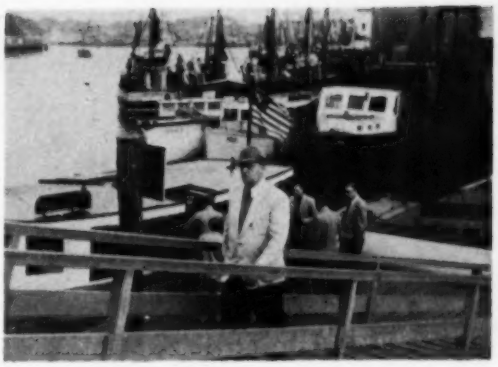
Executive Secretary's Report In his report before the ready-mixed-concrete board Vincent P. Ahearn, executive secretary, described the status of the work of the OPS Advisory Committee on Ready-Mixed Concrete. After considering several possible courses of action the Board voted to have the Association submit formal application to OPS for suspension and decontrol of ready-mixed concrete price control. Mr. Ahearn told of the excellent case made for exemption of ready-mixed concrete from renegotiation.

Mr. Ahearn said that the Association's 4-year-old cost accounting manual is no longer adequate and that some better method is needed to help each company accurately to determine its cost. Most producers, he said, do not now know their actual costs, and this is a great handicap to them, especially when dealing with the government and unions. A new system for expanding uniform cost accounting procedures in the sand-and-gravel industry will be presented before the San Francisco convention.

Federal Legislation Mr. Ahearn told of several bills before Congress which would impose a tax on private carriers for hire, including both water and highway traffic. The combined boards voted in favor of a resolution to oppose any regulation of private carriers by whatever means.

The combined boards agreed that the associations should take no stand on industry-wide bargaining but that area bargaining should be permitted. Otherwise a union could strike one company in an area, force it to sign an unfair agreement, and then use this agreement to get other producers in the area to sign. A case was cited where in an Illinois county the union struck one company and the other three producers in that county shut down voluntarily. After eight weeks the union agreed to let area-wide bargaining continue.

Robert Mitchell (Consolidated Rock Products Company) said that the tidelands legislation being proposed is not of interest only to the oil industry as most people think. It also affects all nonmetallic minerals and natural resource industries, not only in coastal areas, as it might eventually affect any submerged deposits, especially sand and gravel. He urged that the Association go on record as favoring legislation to keep control of tidelands in the hands of the states, where it has been for many years. The combined boards of both associations voted in favor of such a resolution.



F. P. Spratlen Jr. (Ready Mixed Concrete Co., Denver), coming up the gangplank at Gloucester, Mass.

According to Mr. Ahearn, the Walling Ruling is back in litigation; this ruling stated that if any material entered in any way into anything in any way connected with interstate traffic, the production of that material came under the Wage and Hour Law, including its health and safety provisions. The boards voted to oppose such application if the association counsel approves this stand.

Group Insurance Mr. Ahearn reported that work on the group insurance program is still going forward but that not enough companies have yet joined up to bring the number of employees affected to the minimum of 600 required. He said that many companies already have their own insurance plans and that others want more information and time for further study of the plan. He also pointed out that the southern California associations in both industries also have their own programs.

At the joint meeting two representatives of the John Hancock Life Insurance Co. explained the details of the group insurance plan for the ready-mixed-concrete industry and explained how a similar program could be applied to the sand-and-gravel industry. It was also explained that an N.S.G.A. member who is also a member of N.R.M.C.A. can join in the latter's plan for all his operations. Also if the plan is later adopted by N.S.G.A., an N.R.M.C.A. member can extend it to both operations with a minimum of trouble. This plan has many provisions for liberalization, expansion, and other alteration, so that it can be made to fit the needs of any company. There is also a dividend arrangement which may reduce its cost considerably and put an emergency fund in the hands of the employer.

Industrial Radio Mr. Ahearn described briefly the situation with respect to the use of industrial radio communication by the sand-and-gravel and ready-mixed-concrete industries. The present regulations, he said, are being revised, and it is thought possible that the Federal Communications Commission might revoke some existing licenses in or near large centers of population. The boards voted for the associations to work for the continuation and extension of radio use in these industries.

Safety Program It was announced that the participation by member companies in the N.R.M.C.A. Safety Contest was at an all-time high. However, although the figure of 177 companies entered is impressive, it still represents only about one-third of the membership, and those not now entered should do so at once. The three winners of the 1951-52 contest ending at mid-year were announced. In addition, there were 47 other companies with accident-free records, and because of the large number, their Certificates of Achievement will be mailed to them instead of being presented at the annual convention as in the past.

Following are the winners in the three divisions, each of whom will be presented with a PIT AND QUARRY Safety Trophy at the annual convention.

Class A (Companies producing more than 100,000 cu. yd. of concrete during the contest period)—Fischer Lime & Cement Company, Memphis, Tenn.; Class B (50,000-100,000 cu. yd.)—Morse Sand & Gravel Company, Attleboro, Mass.; and Class C (Under 50,000 cu. yd.)—Thomas, Bennett & Hunter, Inc., Westminster, Md.

Pioneer Products Firm Keeps Step With Times—Ups Output 500 Percent

The plant of Cinder Block of Richmond, Inc., with the boiler room at the left, the aggregate bin in the center, and the office and cement bin at the right.

another ON THE SPOT report

THE Cinder Block Company of Richmond, Inc., Richmond, Va., is said to be the pioneer producer of concrete products in that state, having started production on a small scale in 1921. When Garnett Burgess formed the Richmond Patented Building Block Company, no cinder concrete products were being made in that area and, at times it seemed that this type of product would not take hold there. In time, however, Mr. Burgess's faith in cinder blocks was justified, and this product is now used on a large scale for a wide variety of uses. The use of cinder blocks in Richmond was strongly restricted until the building code was changed in 1938. Since

By WALTER E. TRAUFFER

then their use has expanded rapidly and the output of cinder blocks and other products at this plant has increased over 500 percent.

The original plant used the machinery and methods prevailing in 1921. Every block had to be handled manually many times before it was ready for shipment. As new and more efficient machinery became available, the old was discarded, keeping the plant abreast of the most modern practices. During World War II the shortage of other aggregates in this area brought cinder blocks into prominence; and when the war was over, a completely new and larger plant was built to handle the demand of the anticipated post-war boom. Included was a cinder processing department designed to remove any undesirable substances, such as iron, from the cinders in order to prevent staining. A system of low-pressure, high-temperature steam curing was also installed which is so versatile that the National Concrete Masonry Association is now conducting curing tests at the plant without interference to normal operation.

Garnett Burgess died in 1945, and soon afterward his two sons, Charles Burgess and James G. Burgess, returned from the service. Their efforts, combined with those of T. G. Shepherd, then acting general manager, resulted in the above developments. At this time the company name was also changed from Cinder Block Company to the present Cinder Block Company of Richmond, Inc.

On September 8, 1951, a fire starting in the employees' locker and wash room destroyed the important production machinery and most of the plant, at a loss of $100,000. In five months the plant was rebuilt, with an all-concrete, fireproof wash room. New machinery was received

The new high-capacity block machine, with its pneumatic offbearer and magnetic pallet return. Note the cleanout pit under the machine.

Features of the new block machine are the traveling weigh larry batchers, and the dual mixer carriage and skip (background).

on February 1, 1952, and the plant was back in operation on February 11. The three Joltcrete No. 9 machines were replaced by the first of the new Gocorp King machines made by the Gene Olson Corporation. This hydraulic plain pallet machine, after a short tune-up period, reached its average capacity of 1,100 (8-in. equivalent) blocks per hour, but it has made up to 1,200 blocks per hour. In a 12-hr. day this machine equals the output of the three former machines in a 9½-hr. day.

The only major items not destroyed by the fire were the cement and aggregate storage bins, so the plant was rebuilt around these. The overhead rail system of these bins was buckled in the fire, but this was soon rebuilt. With this system there is ample space for the installation of additional machines in the future.

A split shift system has been devised which makes possible a maximum of operating time with a minimum of employees. One group starts at 7 a.m. and works until 5 p.m. Another group starts at 11a.m. and works until 9 p.m. In this way the machine is in operation during practically the entire day, not even stopping for a lunch period. Two men can do each of the most important jobs; for example, two men alternate at the machine, operating the offbearers on 2-hr. shifts. The entire plant crew consists of 24 men, including 7 truck drivers and those working in the cinder crushing and screening department and making lintels and other precast products.

The cinders which are used in most of the output of this plant are obtained from local sources and others from as far distant as Maryland and Pennsylvania. Sand and gravel and expanded shale aggregates are also used to some extent. These aggregates are received in railroad cars and trucks which discharge to the same plant hopper. A National car shaker speeds up the unloading of cars. Large stockpiles of these aggregates are maintained. A clamshell crane unloads these materials from hopper cars, that part of the load not so reclaimable being discharged into the track hopper. The crane also feeds the aggregates from the stockpiles into the hopper.

Charles Burgess, president of the firm, and James G. Burgess, vice-president and secretary.

The aggregates are fed from the track hopper by bucket elevator to a belt conveyor which has a Stearns magnetic head pulley. This removes any iron in the cinders and any other metal. A New Holland vibrating screen feeds the coarse cinders to a Bartlett & Snow roll crusher. The screen throughs and the crusher product are carried by a belt conveyor and a cable bucket elevator to the top of the aggregate bin, where a Tyler two-deck screen makes two sizes—¼-in. minus and ¼- to ½-in.—which are discharged into separate compartments of a two-car bin. The oversize from the screen is discharged into a New Holland secondary roll crusher and to the cable elevator in closed circuit.

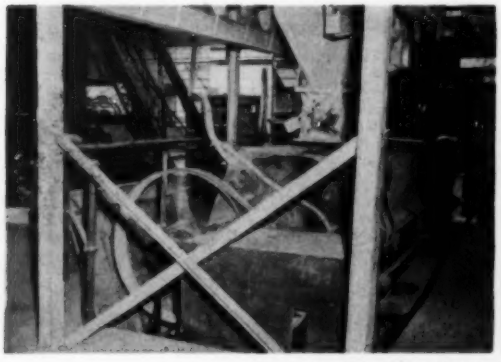
When a change is to be made to another kind of aggregate, the bins are allowed to empty. The same handling system is used but the crushers are bypassed.

At the opposite end of the plant bulk cement is unloaded from special covered hopper cars. A screw conveyor feeds to an elevator which discharges into the 1,000-bbl. Blaw-Knox bin.

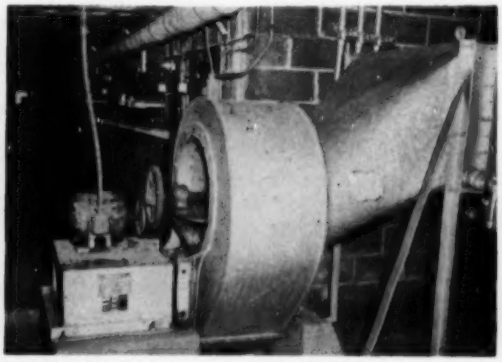
There are separate electric-motor-driven weigh batching larries for the cement and aggregates. The cement bins and larry are equipped with rotary valves and the aggregate bin and larry with lever-operated clamshell gates. The cement batching is done by the man who does the cement unloading, and the aggregate batching by the cinder plant operator. The mixer operator controls the movement and the discharge of the larries into the two 42-cu. ft. Stearns concrete mixers. These are on a rail-mounted frame, also electric-motor-driven, so that the mixers can be discharged alternately into the skip bucket of the block machine.

The skip bucket feeds into a hopper at the top of the Gocorp King block machine. This hydraulic plain pallet machine is completely automatic and is rated at 18 or more 8-in. blocks per minute. It is said to incorporate several new basic principles of design. One feature is the use of two mold boxes, one of which is making blocks while the other is being discharged.

Three standard blocks are made at a time and two pallets (or 6 blocks) at a time are removed by



The two mixers, mounted on a motor-driven carriage so that one can be charged from the traveling weigh larries while the other discharges via the skip bucket to the block machine.



One of the two fans, with steam-heating coils at the intake, which can provide hot or cool air to the kilns through ducts under the floor.

the pneumatic offbearer to the 72-block racks. The offbearer is magnetic and returns pallets from the rack to the machine with no lost motion. The machine automatically scrapes and oils the pallets, and turns them over so that the face of the pallet being used is alternated, thus preventing any tendency to dish.

The use of two mold boxes makes it possible to make two different sizes of blocks at one time.

The machine has no feed drawer, but instead each of the mold boxes are alternately brought under the main feed hopper for its charge of concrete. All steps in the production cycle are independently and quickly adjustable to best accommodate the aggregate and unit size being produced. The vibration of the molds is induced by a rather massive but simple-appearing device which employs the principle of resonance. This is said to result in "whip-like" direction reversals, quieter operations, and less abuse on mechanical parts. The entire machine moves smoothly and quietly in spite of the high rate of speed at which blocks are produced. According to Charles Burgess, president of the company, this machine has been remarkably free from trouble and can be quickly and easily repaired. The mold boxes can be changed in half an hour.

A feature of this machine is its accessibility, and in this installation this is further enhanced by a shallow cleanout pit under the machine. Not only does this give better access to the machine for cleaning and repair but all droppings go into this pit, where they do not interfere with operations and from which they can be easily and quickly removed.

The blocks produced are true and square, and very few are cracked or broken in transferring to the racks.

Another view of the plant, showing the aggregate and cement bins. At the right are the curing rooms, showing roof ventilators.

Because of the high rate of production it has been found most economical to run any such blocks on through the kilns and weed them out in the yard. The hard culls are then fed through the crushers with the cinders.

Every size and type of block is made: 3-, 4-, 6-, 8-, and 12-in. hollow and solid, as well as all specials, fittings, etc. A large percentage of the output goes into homes for wall construction—4-in. block on the inside and 4-in. clay brick on the outside is a popular type of construction in this area. All-block houses are gaining in popularity, and the company is pushing this type.

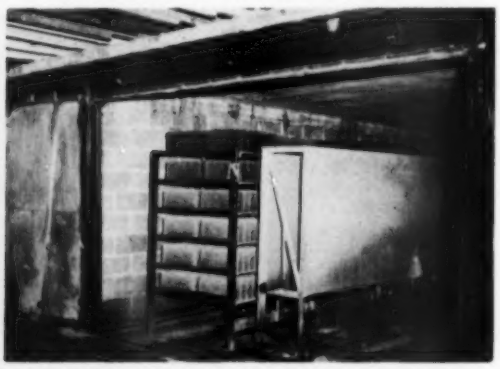
The cinder blocks are made under Underwriters Laboratories' supervision. Making 20 standard 8-in. blocks per sack of cement, an average strength of over 1,000 lb. is obtained at 7 days; the local requirement is 700 lb.

An Erickson platform lift truck is used to handle racks to and from the 10 kilns or curing rooms which have a capacity of twenty 72-block racks each. These kilns are arranged in a single row and are open at one end. The company-designed curing system provides for both steam and hot air curing and for blowing out the kiln. Steam is provided by an Erie City 150-hp. boiler which is fired with No. 6 fuel oil—a heavier oil than is ordinarily used but more economical. A master steam line in a corridor behind the kilns has branch lines into each kiln. The steam line in each kiln runs about a foot above the floor and between two aluminum sheets running down the center of each kiln. The steam coming out of the pipe hits these sheets and is directed upward instead of hitting any blocks directly. The billowing effect at the top of the

(*Continued on page* 225)

The steam pipe lines to the kilns and thermostats, switches, etc., which automatically control the curing process.

A view inside one of the kilns, showing the baffle arrangement over the steam pipe and air duct.



Block Maker Develops New Ejector And Front-Pallet Feeder Mechanism

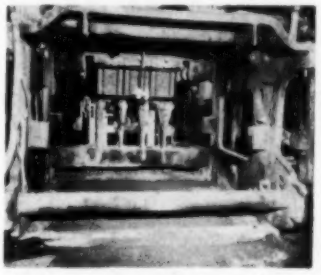
Also works out simplified device for height and density control.

another ON THE SPOT report

THE Oswalt Company of Forest Park, Ill., in all probability has about the highest production per square foot of ground of any block plant in the country. All storage, handling, and productive operations involved in the manufacture of approximately 7,200 8-in. equivalent masonry units per 8-hour day are accommodated on a plot of ground which measures 75 ft. in width and 125 ft. in depth. With rigid boundaries on all sides and a zoning situation which prohibits extra shift operations, the company has had only two means open to it for the expansion of production: to make more efficient use of the existing space, or to start over at a new location.

Some five years ago the company's management embarked on a development program geared to the first of these two possible solutions. One of the first tangible results of this program was the development in 1948 of a new principle of mold box vibration which effected a substantial reduction in the time required to properly compact concrete masonry units. First announced to the industry in the September, 1948, issue of THE CONCRETE MANUFACTURER, the Oswalt principle of compaction became known as Synchronized Dual Vibration; and a subsidiary organization, the Oswalt Engineering Service Corp., was formed to render technical services in connection with the installation of the new vibrating mechanism.

Applied to Oswalt's own block machine, Dual Vibration made it possible to increase operating speed from 3⅓ cycles (10 units) per minute to 5 cycles (15 units) per minute without any adverse effect upon the machine or its product. The success which Dual Vibration scored in the field provided the means for a continuous development program by the company's service subsidiary, using the productive facilities of the Forest Park block plant for full-scale experimental work.



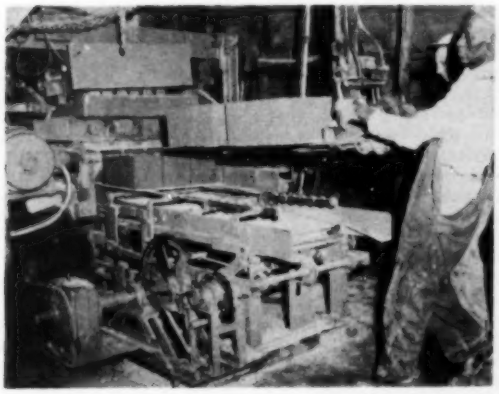
• A view from the rear of the block machine shows how front pallet feeding clears the area for maintenance and cleanup work.

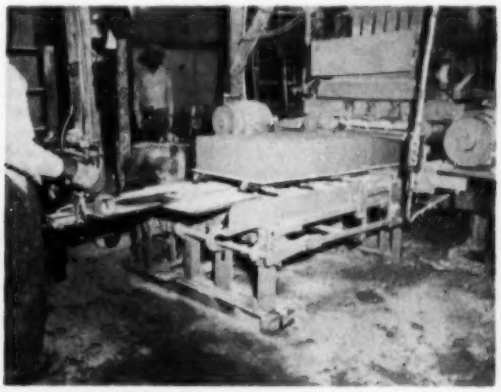
One of the most impressive results of this program is the Oswalt block ejector and front-end pallet feeder, a device which was initially installed at the Forest Park plant about two years ago. It was conceived in an effort to reduce the possibility of cracking of green block in transit from the mold box to the delivery conveyor.

On the basis of the company's own experience, as well as extensive observation in other block plants, engineers of the Oswalt organization felt that green cracking was to some extent the result of abrupt starting and stopping of pallets on the delivery conveyor. To achieve the smooth, gentle handling which they considered essential, they have developed a comparatively simple mechanism which utilizes harmonic crank action to start loaded pallets from the machine very slowly, to impart gradually accelerated forward motion, and then to reverse the entire process in bringing the pallets to rest.

The actual pick-up takes place as the crank is at the extreme end of its stroke, so that there is no forward motion at the instant the rails of the delivery carriage rise under the pallet. The carriage moves away from the block, attaining its maximum

• The block ejector and front pallet feeder mechanism viewed from the drive side. The device accommodates three pallets simultaneously.





• The block ejector seen from the opposite side. Two pallets, gripped mechanically by the device on the under side of the off-bearer, are being fed to the pallet magazine.

speed as the crank passes its vertical center, and thereafter decelerating until the opposite end of the stroke is reached. When the forward motion of the carriage has stopped, the bars on which the pallet is supported are automatically lowered, and the pallet of green block is deposited on two fixed rails. The return stroke of the crank places the carriage in position to receive the next pallet as it comes from the block machine.

Once the machine is operating, two pallets are picked up, moved a distance of 20½ in., and set down at each complete stroke of the crank. The entire operation is perfectly synchronized with the block production cycle, since a take-off shaft drives the ejector-delivery mechanism from the block machine itself.

The pallet feeder is an integral part of the ejector-delivery mechanism and is operated by the same crank which actuates the delivery carriage. Its main components are a magazine at the far end and a system of rails, chains, and dogs for feeding one pallet at a time into the block machine. It operates only about one-third of the time that the machine is operating. Pallets are placed in the magazine two at a time, using the offbearer to convey them from the curing racks. In the Forest Park installation this is accomplished by an air-actuated clamping device located on the under side of the offbearer fingers, with considerable reduction in the weight and bulk involved with comparable magnetic equipment. While it is felt that the mechanical method speeds up the operation of offbearing, the new equipment will operate equally well by either means of gripping the pallets.

The new block ejector and front-end pallet feeder is designed to handle blocks at speeds up to 1,080 units per hr., but at Forest Park the mechanism has actually been run at the rate of 21 blocks per minute (1,260 per hr.) without causing cracks. Tests at this high output rate were made with a water-cooled slag aggregate, a material with which the operators of the Oswalt plant have had the greatest difficulty in respect to the occurrence of green cracks.

In addition to eliminating a source of green cracking, the block ejector and front-end pallet feeder is said to permit easier access to under parts of the block machine for maintenance and cleanup purposes. Since it is essentially an independent mechanism, it may readily be disconnected and removed from in front of the block machine by means of a lift truck, thus leaving a clear aisle from the back of the machine to the front.

Another recent Oswalt development is a means of height and density control which is said to be sufficiently simple that it can be maintained and repaired by ordinary plant personnel. Four colored lights mounted on the front of the block machine and wired in with the control mechanism give the operator a complete and accurate reading of machine performance. Correct, uniform height is achieved automatically since the vibrating motors remain in operation until the pins meet, even though the mold box may be overfilled, while the adjustment of a special timer assures uniform density by making it possible to vary the machine cycle in accordance with variations in the moisture, flow characteristics, and other properties of the material.

Thus, if insufficient material flows into the mold box to produce units of the desired density, this fact is immediately indicated by the colored lights, and the control dial is adjusted to hold the feed drawer over the mold box for a moment longer. Similarly, the feeding time can be shortened slightly if too much concrete flows into the mold box. Where there are wide variations in the grading of materials and in the amount of water in the mix, height and density control are achieved at the expense of some loss in production. With proper close control of the batching and mixing operations, this loss becomes progressively smaller.

Subscribers to Oswalt Engineering Service were given a preview of these developments at the Forest Park plant early this month.

American Concrete Institute

(*From page* 216)

marked, "Furnish the design, and the contractors will apply their ingenuity to build."

Charles S. Whitney, Ammann and Whitney, Milwaukee, Wis., who has been a leading advocate of shell construction in this country, described his first barrel-hangars which had 190-ft. spans, and were built in France in 1918 and 1919. He has since built a number of shell-roof hangars and auditoriums in this country which have proven economical and serviceable. A hangar of this type is under construction at the Chicago airport, and a similar one at St. Louis is under contract.

A particularly interesting description of three very large precast concrete "boxes" used in the construction of Pier 57 in New York harbor was given by Captain Praeger, who had previously described the use of pre-stressed beam members in the same structure. These "boxes" formed the foundations for the pier; two were 360 ft. long, 127 ft. wide, and 32 ft. high, and weighed 28,000 tons each; the third was smaller, weighing 19,000 tons. They were cast in a yard some 38 miles upstream from the pier, were floated down, and sunk onto previously prepared positions. By their use the contractors avoided the construction of large cofferdams out into the Hudson River. The two larger "boxes" were probably the largest precast units ever built.

The use of precast concrete in highway bridge construction was discussed by E. L. Erickson, Bureau of Public Roads, Washington. Precast girders up to 80 ft. in length were made in France as early as 1904, and such construction, usually with a reinforced slab on top, was recognized in some specifications in the United States in 1908. Railroads have used precast slab bridges for over 40 years. In many instances the speed of erection at the site has been an important consideration. The paper concluded that with the growing use of standard sections, the precast type of construction is becoming more competitive in cost with "cast in place".

A new series of fire tests in concrete floors made of various materials, now underway at the Underwriters' Laboratories in Chicago, were described by J. P. Thompson, Portland Cement Association. The tests have re-affirmed the value of reinforced concrete as a fire-resistant material. Movies were shown of the fire tests conducted on masonry walls and concrete slabs, which illustrated the degree of protection under very severe temperature conditions.

A number of exhibits in the hotel corridors, showing applications of precasting and prestressing for different types of structures, attracted wide attention.

At West Memphis, Tenn., the Garrison Ready-Mixed Concrete Company recently put into service a 3-cu. yd. GMC truck-mounted transit mixer, bringing its fleet of mixers to 41 . The firm went into business in 1946 and began operating the present plant in 1949, starting with three truck-mixers. Garrison also operates a plant at Milan, Tenn.

Paul C. Searles was recently named president of the Conneaut Concrete Products Company, Conneaut, Ohio. He will be associated with his brother, Sperry L. Searles, who operates other similar plants in Ohio.

Washington Concrete Products Men Hold 24th Fall Meeting at Yakima

FOR THE second consecutive year the Concrete Products Association of Washington held its fall meeting in Yakima on September 12 and 13, 1952. It was the organization's 24th such convocation.

Saturday morning was given over to meetings of the various committees to discuss and formulate plans for the coming year. At noon a luncheon was served at the Airport Chateau at the Yakima Municipal Airport. After a short business session, committee reports were made.

Ellis Cummins, chairman of the Pipe Research Committee, introduced John Roberson, research engineer, Division of Industrial Research, Washington State College, Pullman, Wash. Mr. Roberson reviewed and summarized his studies, both as regards water hammer due to air action and compressive stresses in irrigation pipe lines resulting from dimensional change due to moisture.

J. W. James, block research committee, introduced W. E. Cox, research engineer, Division of Industrial Research, Washington State College. Mr. Cox announced that successful tests have been made with "Silielear" and "Daracone", two colorless silicone paints. These tests are in addition to the 40 tests listed in Bulletin 214 printed by the Division of Industrial Research, Washington State College. Mr. Cox distributed a progress report on "Dimensional Changes in Unit Masonry" and described the results of the tests.

Dr. R. L. Albrook, director of the Division of Industrial Research, discussed silicones; he stated that the State College is continuing its studies on coatings for masonry and that it would be glad to test additional samples.

In regard to the pipe studies by Mr. Roberson, Dr. Albrook mentioned that there were other problems in connection with this work which need study and for which studies the Division of Industrial Research has facilities. The subjects suggested were: *Study of Air and Methods of Release from Pipe Lines, Expansion Joints,* and *Dome Outlets.*

J. B. Lundberg, pipe standards committee, reported on the discussion of sewer pipe joints at the meeting with the association directors. It was suggested that this committee contact all member plants and get information on all the various types of joints in use; tabulate the data; and attempt to secure agreement on a single sewer pipe joint which the Association can establish as a standard for the area.

Verne Frese, block standards committee, briefly outlined the architectural specifications which were proposed as an addition to the recommendations for concrete masonry, and was authorized to have them printed.

Mr. Frese was called upon to outline the activities of the committee from the Concrete Products Association of Washington to study the proposed formation of a regional branch of the National Concrete Masonry Association. The area suggested to be covered by a regional branch is Washington, Oregon, and Idaho. He briefly outlined the discussions and suggestions at the Portland meeting on August 15. He stated that the Portland group was very much in favor of forming a regional N.C.M.A. organization.

Carl Smithwick, president of Smithwick Concrete Products, Portland and Eugene, Ore., a national director of N.C.M.A., and an associate member of the Concrete Products Association of Washington, was called on to discuss the formation of a regional N.C.M.A. group, which he regarded as a desirable move. It was decided to hold a special meeting of the block manufacturers early in October to continue the discussion.

Later an interesting and informative talk was given on the construction and operation of the various irrigation units in the Yakima Valley by Cyril Lentz, assistant superintendent, Yakima Project, U. S. Bureau of Reclamation.

While this was primarily a business meeting, quite a number of the members' wives were entertained on Saturday afternoon by the Yakima Cement Products Company. The ladies were served luncheon at the golf club and taken for a scenic drive to the Tieton and Naches Heights districts.

Cinder Block Company

(*From page* 222)

sheets is then directed downward from the ceiling, creating a circulating action which insures against dead spots.

At each end of this corridor is a Clarage fan with steam coils at the intake to heat the air when desired. These fans blow into a common duct under the floor of the corridor. From this main duct 1-ft. wide ducts branch off down the center of each kiln under the floor. Openings in this duct release the air into the kiln and ventilators in the roof release it to the atmosphere.

Two hours after a kiln is filled with blocks, the steam is turned on and the temperature brought up to 170 deg. F. in a period of 2½ hr. This temperature is automatically maintained for 8 hours, after which the steam is cut off. A 6-hr. soaking period follows, after which the kiln is blown out with air at atmospheric temperature. When the blocks are to go to a job with moisture specifications, the soaking period is replaced by a 6- to 8-hr. period during which air preheated to 145 deg. F. brings the moisture content of the blocks down to a point of 25 to 30 percent total absorption.

Minneapolis-Honeywell automatic valves regulate the temperatures and curing periods for each kiln. During the day the plant superintendent cuts the kilns on and off; at night this is done by the night watchman, who also cleans up the plant.

The blocks are cubed in the yard or under roof in bad weather. A Hyster high-lift truck stacks these cubes three high and rehandles them to trucks for shipment. There is yard space for the storage of at least 700,000 blocks, but there are seldom more than 150,000 in storage at one time, as the demand has been high the year around.

Most of the deliveries are made in 7 company-owned trucks—Fords and Federals—consisting of 3 trailer trucks, 3 flat-bed trucks and a dump truck. The company employs two salesmen and has developed a large dealer trade which covers a radius of 75 to 100 miles around Richmond.

Officers of the company are as follows: Charles Burgess, president; James G. Burgess, vice-president and secretary; T. G. Shepherd, vice-president and sales manager; Lynn A. Blue, assistant secretary. Aubrey Burgess (no relation to Charles and James) is plant superintendent. The company is an active member of the National Concrete Masonry Association and of the Virginia Concrete Masonry Association, the latter a young but active and growing organization.

How You Handle Property Affects Your Income Tax

By BETTY LEE GOUGH

WHEN and how does *what you own* qualify as an income tax deduction? Here are a number of questions about property-and-income tax that concrete manufacturers frequently ask, together with authoritative answers:

Question: Can I depreciate all of the property the plant owns?

Answer: On the books you keep for yourself, yes, if you wish to. But on bookkeeping for Uncle Sam's tax men, you cannot.

The *land* on which your building stands (if you own it) cannot be depreciated. Land does not wear out; and unless it should be actually sold at a lower figure than the amount which was paid for it, it does not lose in value. (In the event of a sale of land for a real dollar loss, the loss may be deducted as either a long-term or a short-term loss, depending upon whether it had been held for less than six months or longer.)

However, the *improvements* to the land depreciate in value. These are the things which man made and placed upon the land.

Moreover, any other property which has a useful life of one year or longer may be depreciated. If it's a mere supply item designed to be used and then discarded, or another thing which lasts less than a year before wearing out, its cost may be charged off directly as an operating cost.

Question: Over how long a time may the cost of various depreciable items of property be amortized?

Answer: The Bureau of Internal Revenue issues a "green book" of probable useful lives. The figures in this book are, of course, only "average" figures which apply to most plants. The governing factor in figuring out how long to carry depreciation on an item is the actual useful life of the property.

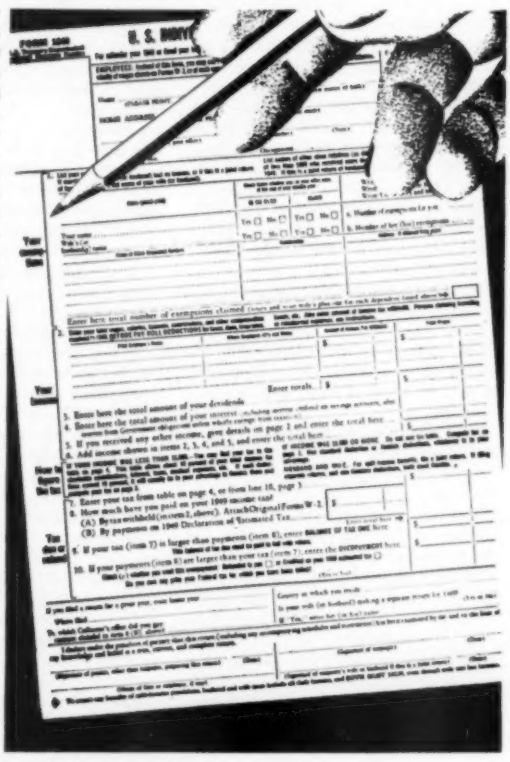
Question: "What sort of bookkeeping does the Treasury demand in computing depreciation on longer-than-a-year-of-useful-life property?

Answer: The Treasury does not demand any special method. *However*, the way you do it must conform to some established accounting practice, and it must be consistent. It can't be on one basis this year, and on another basis next year. The Bureau of Internal Revenue has this to say on the subject:

"The capital sum to be replaced by allowances for depreciation over the useful life of the property may either be deducted in equal annual installments or in accordance with any other recognized trade practice, such as apportionment to units of production. While no specific method is prescribed, whatever plan or method of apportionment is adopted must be reasonable and cannot be changed in a later year without the consent of the commissioner. The methods in general use by taxpayers are the "straight-line" and the "unit of production", the latter being used for the most part by taxpayers owning natural resource property. These, with other methods used to a lesser extent, are described below.

"Under the straight-line method, the cost or other basis of the property, less its estimated salvage value, is deducted in equal annual installments over the period of its estimated useful life. Ordinarily, the depreciation deduction is computed by applying a depreciation rate expressed as a percentage to the cost or other basis to be recovered, but it also may be computed by dividing that cost or other basis by the estimated useful life. The estimated useful life is subjected to modification in the light of conditions known to exist at the end of each taxable period. Ordinarily, depreciation computed by this method represents the actual diminution in service value from year to year as closely as the depreciation computed by any other method. The practical simplicity in accounting records required and the ease and facility by which revisions or changing life estimates may be applied tend to make this method the most acceptable one for general use.

"Unit of production method is peculiarly applicable in determining depreciation for property used in the exploitation of natural resources, such as mineral deposits or timber, the available reserves of which limit the useful life of the depreciable property. Under such circumstances, the rate of exhaustion of the natural resources measures the useful life of the physical property. By dividing the cost—or other basis—less estimated salvage value by the estimated available reserves of raw material a unit cost is obtained which, when multiplied by the units pro-



• Note carefully your legitimate exemptions.

duced during a given year, gives the depreciation sustained for that year. Depreciation, at least to the extent of that based upon decay and normal obsolescence, is allowable and should be deducted during the period when property is idle or is producing at a rate below normal.

"In the case of depreciable property the useful life of which is not limited by sources of supply, however, uncertain and unpredictable factors arise to such an extent as to make application of the method very difficult, if not impossible. Use of the method must be confined to these items in the property account whose useful lives are determined by the factors of wear and tear or where the extent of use or the rate of production measures the rate of exhaustion of the property. When such a separation can be made, it is then necessary to forecast for those items the useful lives of which are controlled by extent of use the total number of units to be produced during their useful lives, in order to obtain a cost factor to be applied against units produced each year in arriving at the depreciation allowance. For most property it is not possible to obtain this information with any reasonable degree of accuracy and, therefore, the method is not considered an acceptable one for general application to the machinery account of industrial concerns, or to the property of those companies exploiting a natural resource with reserves sufficient to extend operations beyond the physical life of the original plant.

"Under the declining balance method the amount of depreciation is subtracted annually from the cost or other basis of the property and the rate applied only to the resulting balances. Depreciation on any single item is largest in amount the first year and declines each year thereafter. This method gives satisfactory results for accounts that are being constantly replaced in substantially equal amounts, provided the rate used in somewhat higher than that applicable under the straight-line method. Its best application is to those accounts for property in which the greater proportion of the production is confined to the early part of the useful life.

"In retirement accounting for depreciable property, the cost of property retired each year is credited to the capital asset account and, less net salvage (actual or estimated), charged to expense in lieu of annual provisions for depreciation. When property acquired prior to March 1, 1913, is retired, the cost

Heltzel BUILDS IT BETTER

HELTZEL HELPS
CONSTRUCTION DOLLARS
GO FURTHER

NASSAU DOCKS, INC.
REORDERS HELTZEL BINS

Often empties over
3 bins per hour

PROBLEM: To have overhead storage of 1½", ¾", ⅜" stone and run-of-crusher limestone screenings which are delivered in barges; to fill and empty the bins quickly into trucks having 14 to 16-yard capacity; to deliver aggregates in proper proportion from the same bins to an asphalt plant on a conveyor belt. These were the Nassau Docks, Inc., problems.

SOLUTION: Nassau Docks, Inc., ordered four 18-foot diameter, 150-ton capacity Heltzel bins, and at a later date, six more. A two and one-half yard clam-shell loads the bins. For discharging, double-acting clam-shell gates (16" x 16") operate from the ground level. During busy days at Nassau Docks, three or more bins are emptied per hour. The superintendent says that any one of 4 aggregates, or any combination of them, can be moved on the conveyor belt to the asphalt plant.

● Nassau Docks, Inc., furnishes aggregates for its own asphalt plant, for contractors and Hendrickson Brothers, with whom Nassau Docks is allied. Specialized Heltzel engineering features circular and square bins; 50-degree sloping sides of cone; a choice of clam-shell, single arc or roller gates ranging in size from 12" x 12" to 30" x 30" which are air or manually operated.

Ease of assembly is testified to by steel erectors time after time. Heltzel has solved hundreds of similar problems effectively; so why don't you write regarding your storage, loading, mixing, unloading, batching or materials handling problems?

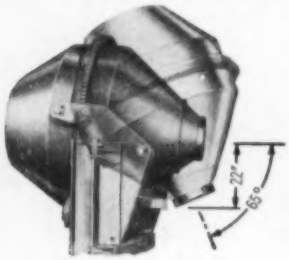
Heltzel BUILDS IT BETTER
The Heltzel Steel Form & Iron Company
Construction Equipment Since 1910
WARREN, OHIO
Flex-Plane

Burmeister

"TILT-UP" MIXER

CUTS PLANT HEIGHT AS MUCH AS 8 FEET

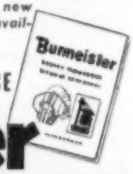
Burmeister's patented "tilt-up" feature—which reduces the mixer's headroom requirement—permits lower plant heights. This means easier crane loading, lower power costs, lower initial costs, less costly "conversions," increased portability, and better over-all control.



● In addition to reducing plant height, Burmeister's 3 cu. yd. "Tilt-Up" Mixer (left) provides a steeper 65° discharge from one spot, eliminates segregation of concrete and the danger of accidental discharge. It is simple to install, and has an integral hydraulic system—no compressor is required. Write for name of your nearest Burmeister Distributor, without obligation.

SEND FOR FREE CATALOG

Your copy of Burmeister's new illustrated Catalog is now available. Write today!



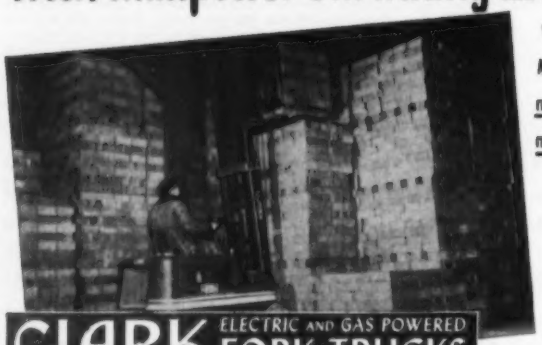
COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4535 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

With manpower shrinking and hard to get,

why not get MORE POWER— more man-hours more production —out of the man-power you have, by using CLARK EQUIPMENT for your Materials Handling.



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AND POWERED HAND TRUCKS · INDUSTRIAL TOWING TRACTORS

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should be reduced to the extent of the depreciation sustained to March 1, 1913, in arriving at the proper deduction.

"While this method results in the ultimate recovery of the total investment in depreciable property and tends to approximate straight-line depreciation over a period of years, there may be considerable fluctuation in the amount of the deduction from year to year due to the retirement of unusually large and expensive units in some years.

"This distortion can be avoided to some extent by anticipating the retirement of such units when the year of retirement can be predicted with reasonable accuracy and spreading the cost or other basis less estimated salvage over the estimated remaining useful life."

Question: Last year we were slapped with a paving lien for the street on which my plant is located. May I take off this tax?

Answer: The Bureau of Internal Revenue says: "Taxes for local benefits such as assessments for streets, sidewalks, and the like, which tend to enhance the value of the property, should be capitalized." In other words—carry the cost on your depreciation records.

Question: An outbuilding where supplies were stored burned to the ground with all its contents. Can we claim it as a loss?

Answer: Certainly. However, there is a "but" attached to this go-ahead. It hinges around how much of the loss your insurance company made good.

Let's say that the out-building was worth $5000 and its contents another $2000. Insurance fully covered both, and the insurance company sent a check to you promptly. You have then actually suffered no loss in money. Uncle Sam doesn't count headaches or lost motion making up for the damage, and so you cannot claim a loss here.

Suppose, though, that only the building was insured, and for merely $4000. You had a net casualty loss, then, of $1000 on the building, plus $2000 on the contents. You can claim full tax deduction for this $3000 business loss.

In other words, it works this way: The loss may be claimed only to the extent that insurance did not repay the money. If your plant had no insurance, claim all the loss. If insurance partially covered the loss, claim only the *net* loss. If insurance paid off to the tune of the full fire loss, you cannot claim a deduction on your income tax return.

Question: Would that work the

COMMENT
from the BUTLER ENGINEER

3 Butler Plants Save U. S. President's Salary

They don't use timber today to shore-up mine tunnels — ("drifts" to the initiated.) Concrete linings are what the well-dressed mines will wear; concrete mixed by Butler Plants, of course.

Here's the story: Cleveland Cliffs Mine Co. is rehabilitating old copper and iron mines in the north Michigan peninsula. It's an amazing operation. Beautiful grounds landscaped like Aladdin's garden. Highly modern housing developments and fine, well-planned streets and highways.

But most modern of all are the concrete lined tunn—well, drifts, some of which are deep enough to make Satan move his feet. Concrete means safety and economy. Three Butler Ready Mixed Plants do the pouring. They save a dollar a barrel over bag cement. That's enough to pay the salary and tax-free emoluments of the President of the U.S.A. I'm sure this gives H.S.T. a feeling of real security until January.

•

There's a new bridge under construction across the Hudson River north of the George Washington span. It carries the Thru-way from the Great West to the Stork Club and the Copacabana. Rated as one of the great bridges of the world —traffic-wise and in length, it owes its sound footing and the span of its future to a Butler Mixing Plant which, floating on the Hudson, pours concrete for the foundations.

•

Obviously Butler Plants are at work just about everywhere. I'm planning a Butler Plant to pour concrete runways for flying saucers. but don't say anything just yet. I have a reputation to protect.

This year let's everybody vote.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

same way for storm damage?

Answer: It would. You can claim any casualty or accident loss only to the extent that it was not made good by an insurance company payoff.

Question: What happens when the insurance pays more than the cost? In my case, a building that had cost $10,000 to erect in 1940 burned down. It was insured for the present replacement value—$15,000 —and the insurance company paid me in full. Do we have to pay tax on that paper profit of $5000?

Answer: That depends. Did your company spend $15,000 immediately to buy or build another structure to be used for the same purpose? If it did, then the paper gain is not taxable, since it went for replacement of the loss with a similar facility. However, if the money was spent for something else, then Uncle Sam wants his tax share of the "gain" on the fire.

To illustrate how this works, let us consider another case. Joe Jones's building cost $5000 to put up back in 1935, but Joe knew it couldn't be duplicated for anything close to that in today's mobilization economy, so he insured it for $11,000. Then, in 1950, a windstorm of hurricane proportions demolished the structure. Joe's insurance agent handed him a check for $11,000 the next week.

Joe then put men to work to put up a new building on the site of the old one. When he had paid all the bills for it, he found that he had spent $7,500. He had a "profit" left over of $3,500, out of his paper gain of $6,000 on the fire.

Uncle Sam did not demand tax on the full $6,000. Since the insurance money had been spent for another building like his old one, any part of the extra money that went for this purpose was tax free: but, explained the collector of Internal Revenue, the $3,500 over and above necessary expenses to replace the building had to be reported on the tax return.

Question: What happens to the charge-off for depreciation when improvements are made to the property?

Answer: Here is the official word from the Treasury:

"Amounts spent in restoring property or in making good the exhaustion thereof, for which an allowance is or has been made, or amounts spent for replacements which arrest deterioration and appreciably prolong the life of the property, are capital expenditures and, strictly speaking, should be accounted for by deducting from the asset account the cost of the item or part thereof

MOVING CONCRETE MATERIALS from a railroad car or Batch-Hopper?

KEEP THEM FROM STICKING WITH A CLEVELAND Air Vibrator!

The Type LSRR Air Vibrator illustrated herewith steps up unloading time of all concrete materials inclined to pack down, arch or bridge in transit.

The LSRR can be easily moved from one installation to another by just lifting from the female bracket, standard on most covered hopper cars. It's a tough, long lasting, efficient unit.

The CLEVELAND Type F Air Vibrator is light weight, yet a hard hitter. No other method of vibration is so mechanically simple. Slugs the side or skin of a hopper and keeps aggregate, cinders, cement, gravel, sand, and other materials stepping right along.

Available in 6 different piston diameter sizes. If noise is objectionable—air-cushioned quiet type available.

BIN STUCK LATELY?

NOTE: These two Air Vibrators are merely typical of our complete line. We have a type and size to fit practically any bin, hopper, chute, screen, storage tank, etc. Catalog No. 105 is yours for the asking.

THE CLEVELAND VIBRATOR COMPANY

2710 Clinton Ave. • Cleveland 13, Ohio

Prepared For You—

1953
LIGHTWEIGHT AGGREGATE MAP

***ENTIRELY NEW* — detailed and informative**

Provides an accurate up-to-the-minute list of all known producers, (established and newcomers alike) including individual company names, location of each plant and lightweight aggregate produced. Over 240 plants listed.

Fully covers the field—cinders, diatomite, expanded clay, shale, slag, etc. An authoritative and indispensable map that is a year-round source of information.

Printed in handy 17" x 22" size for wall or desk use and folds to a convenient size for filing or carrying.

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Send request on your business letterhead. The supply is limited so place your order now. Distribution will be on the first come, first served basis. Write to:

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Built better to last longer!
PROMPT DELIVERY
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Move MORE materials at LESS cost!
Model 230

which is replaced, and adding to the capital account the cost of the new part plus the cost of installation. The cost of the item removed (adjusted for salvage, if any) should be charged to the depreciation reserve. As a practical matter, it is permissible to charge the cost of rehabilitations or small replacements directly to the depreciation reserve, leaving the capital account undisturbed, provided there has been no material change in price levels and no substantial improvement in the new equipment. Replacements in the nature of betterments, however, should always be added to the depreciable asset account.

"The cost of incidental repairs which do not materially add to the value of the property nor appreciably prolong its life, but merely keep it in an ordinarily efficient operating condition, may be deducted as expense items."

Question: And what happens when we sell, dismantle, or junk an item of depreciable property?

Answer: This, in his best Federalese, is what Uncle Sam advises:

"Salvage value is the amount realizable from the sale or other disposition of items recovered when property has become no longer useful in the taxpayers' business and is demolished, dismantled, or retired from service. When reduced by the cost of demolishing, dismantling, and removal, it is referred to as net salvage. In principle, the estimated net salvage should serve to reduce depreciation, either through a reduction in the basis on which depreciation is computed or a reduction in the rate. In either instance the amount of net salvage should actually, or in effect, be a credit to the depreciation reserve. Where the basis or rate for depreciation is not reduced for estimated salvage, all net receipts from salvage should be considered income."

Question: How can I tell which maintainance costs are considered repairs for tax purposes and which must be depreciated over several years?

Answer: There is a simple yardstick which can help you. The yardstick takes the form of a question—"Does this add to the value of the property, or merely protect and maintain it?" If the improvement actually makes the building worth more money, then it must be depreciated. If it protects, cleans, or merely maintains, then it is a repair or maintainance expense, and may be charged directly against the year's receipts on the income tax return.

NEW MACHINERY and SUPPLIES

● Heavy-Duty Lift Truck

Two new heavy-duty lift trucks have been announced by the Hyster Company, 2902 N.E. Clackamas Street, Portland 8, Ore.

These new models, the "ZA-80", an 8,000-lb. capacity, and the "XA-60", a 6,000-lb. capacity, are gasoline-powered and mounted on pneumatic tires. They have shorter overall length, longer wheelbase, and good weight distribution. Other features are: an easily changed long-life clutch; heavy-duty disc-type brakes; indoor or outdoor operation; and ease of operation and maintenance.

● Concrete Identification

Identification color for concrete has been announced by the Reardon Industries, 2837 Stanton Ave. Cincinnati, O.

The color, a red, is added to concrete used to encase underground lines which may carry current or chemicals. Using color in the encasing concrete is said to aid in preventing mistakes when lines are being worked on.

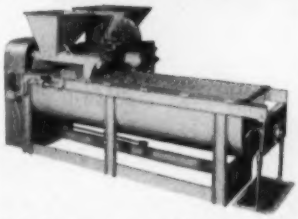
● Diesel Lift Trucks

The Towmotor Corporation, 1226 E. 152 Street, Cleveland 10, Ohio, has announced that four of its models are available with either gasoline or diesel power.

The models that have optional engines are LT-62, LT-60, No. 640, and 480-P. The diesel engines are powerful, with a good ratio of size and weight. They are of a simplified design that is easily serviced, and that has good operating economy.

Jones (formerly Yoder)

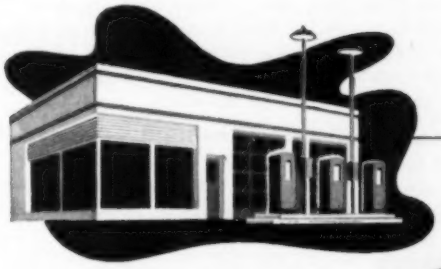
CONTINUOUS MIXER



Embodies many successful new features, such as positive, non-clogging, vibrating belt feed, insuring constant volume of aggregate regardless of moisture content —no need for costly weighing equipment and moisture determinations.

Accurate proportioning through adjustable aggregate gates. Variable Speed drive for requirements ranging from 5 to 20 cu. yds. per hour. Cost only half that of batch mixer. More thorough mixing—gives up to 50% higher strength than 5-minute batch mix. Special advantages for light-weight aggregates. Illustrated literature and other information on request.

J. A. Jones CONCRETE MACHINERY
108 Horning Road, Pittsburgh 34, Pa.



extra white

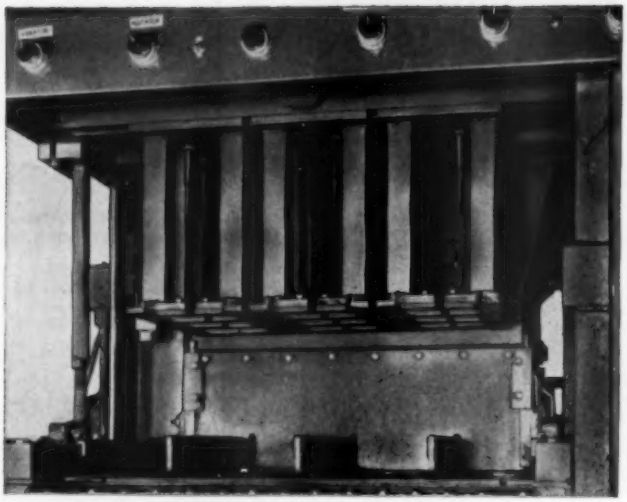
Use Trinity—the *whitest* white cement. A true portland cement that meets ASTM and Federal specifications. Trinity is first choice for architectural concrete units, terrazzo, stucco, paint and other uses. Gives a purer white and truer colors when pigments are added. Ask for Trinity White. General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles; 305 Morgan St., Tampa; Volunteer Bldg., Chattanooga.

TRINITY WHITE
Portland Cement

as white as snow

TRINITY WHITE is a *true* Portland Cement

THE PAUSE THAT ASSURES QUALITY BLOCK

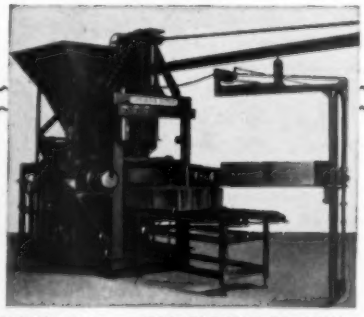


ONLY LITH-I-BLOCK GIVES YOU CONTROLLED STRIPPER ACTION

In the hurly-burly of top speed production, Lith-I-Block producers enjoy one tremendous advantage that puts them out in front of the competition. They know that their block quality is going to be tops, that it will have the uniform density, true dimensions and even texture that brings in more sales and greater profits.

To a great degree, this superior block quality is due to the CONTROLLED STRIPPER ACTION that keeps the stripper head up . . . out of the way . . . during the filling-vibration cycle. This gives each particle of the aggregate ample time to seek its most natural position without unnecessary pressure from the stripper head. You get uniform density throughout the block. You get the highest possible bond strength. And you get those beautiful, even textured surfaces that architects and contractors demand. Then, only when the internal structure of the block has been assured, the stripper head falls to finish the top surface of the block.

The results are always the same, no matter what block you are making, no matter what aggregate you use, no matter how fast you run. Every feature of Lith-I-Block design puts quality *first* and foremost.



MODEL L-5 720 BLOCK PER HOUR

FREE

Get the full Lith-I-Block story, see all of its features and learn the names of nearby Lith-I-Block producers who can show you actual production records that prove Lith-I-Blocks profits. Write for: THE MACHINE THAT BUILDS SUCCESS.

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DEPT. CM-11 HOLLAND, MICHIGAN

Now CLIPPER Gives You A NEW CONVERTIBLE MASONRY SAW!

Here's How . . .

FIRST YOU BUY A CLIPPER MASONRY SAW

and THEN YOU ADD . . . the "CONVERTIBLE" CART

THEN USE YOUR CLIPPER "4" WAYS

① Use as a DUSTLESS Masonry Saw

② Use as a DRY Masonry Saw

③ Slip the head from your Clipper Masonry Saw into the "CONVERTIBLE" CART and you have a Handy Concrete Saw.

④ Place it in tracks and you can cut large stone slabs or transite sheets

GREATER JOB PROFITS THAN EVER BEFORE!

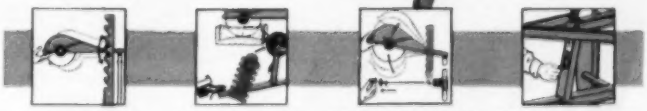
. . . at any time the cutting head of your Model HD Clipper Masonry Saw can be placed on the "CONVERTIBLE" CART (that's all you do)—you're then ready to saw concrete or asphalt patches or trenches! Imagine...switching from cutting glazed tile, concrete, face brick to sewer, water or gas lines or floor patches. No more fractures beyond removal lines—no more spalling!

But there's more . . . just set the "CONVERTIBLE" CART on Tracks and operate as a TRACK SAW. Stone slabs, Transite sheets, Plywood, Masonite, Pre-Cast Stone and large Refractories can at last be easily cut.

MODEL HD
9 models from $265

Try This Combination on FREE TRIAL

Order TODAY . . . on FREE TRIAL. Discover for yourself how Clipper will increase production . . . cut costs . . . increase profits. Only through the Clipper FREE TRIAL ARE you guaranteed . . . ACTUAL TEST on the JOB . . . FULL SATISFACTION . . . NO OBLIGATION! . . . If you prefer, order your Clipper Masonry Saw now . . . and the Clipper "Convertible" Cart when the need arises.



SELECT-A-NOTCH
One man easily adjusts Cutting Head to desired height . . . Whether cutting 12" or 1" material. Operator's hands merely guide. Weight supported by rear Bar.

PRESSURE EQUALIZER
Makes your blades last longer . . . Because Equalizer Spring automatically cushions blade pressure whether cutting HARD or SOFT materials. Outstanding for blade economy.

ADJUST-A-CUT CONTROL
Pull the knob—and the Cutting Head is free for finger-tip setting at any desired angle. Release the Knob—and Head is locked in the desired position.

SAVE-A-BLADE DIAL
Just turn the Save-A-Blade Dial to the material hardness and the Pressure Equalizer Spring automatically sets the tension—guarantees faster cutting and longer blade life.

Clipper

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OSWALT *Announces* TWO NEW DEVELOPMENTS OF HIGHEST IMPORTANCE TO VIBRAPAC OPERATORS

Side view of Block Ejector showing pallets entering magazine

Pallets deposited in magazine. Preparing to lift two loaded pallets

Showing two pallets with blocks being removed with off-bearer

1

SHOCK-FREE BLOCK EJECTOR AND FRONT PALLET FEEDER

This imparts smooth gentle motion in block delivery from the mold and eliminates the chief cause of green cracking, so that culls are reduced to a minimum.

The pallets are automatically fed back through a magazine to the mold box from the front end of the machine, which saves time and simplifies handling.

Entire mechanism is so compact that the space under rear of machine is clear of chains, shafts and gears, making clean-up easy and safe for workmen.

2

SIMPLIFIED DEVICE FOR HEIGHT AND DENSITY CONTROL

Correct, uniform height of blocks is assured automatically by control of the vibrating motors, while the adjustment of a special timer maintains constant density. Signal light system enables operator to govern feed so as to compensate for variations in mix.

These added features of Oswalt Service are designed to handle block production up to speeds of 1080 units or more per hour . . . without sacrifice of quality or the cracking of green blocks.

Write for details of these valuable new Oswalt Services

Many satisfied customers operating scores of machines

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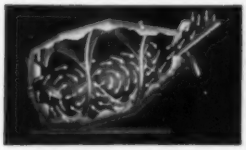
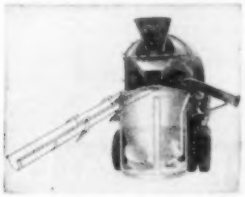
Write for name of Oswalt-Serviced Plant nearest you

Only Jaeger offers these advantages, *plus* light weight for biggest payloads



Longest life drum, fastest to charge, mix and discharge

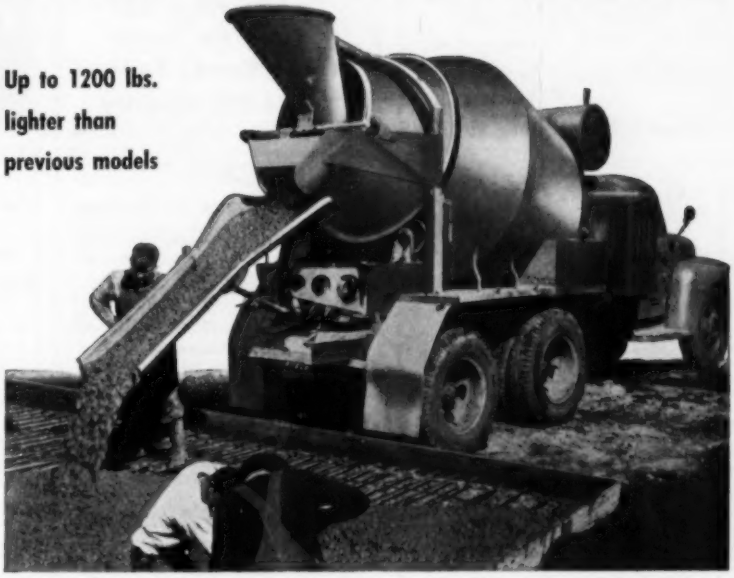
No change in proven superior design and heavy duty construction of the Jaeger "dual mix" drum. All supporting members designed for maximum material loads.

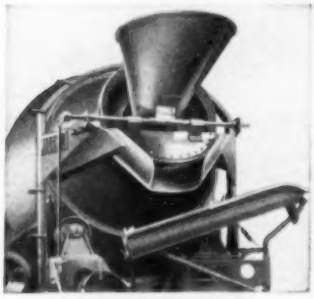


"To-the-Spot" 3 piece chute

Instantly swings aside for extra big buckets or provides 5' to 13' chute combinations for any condition.

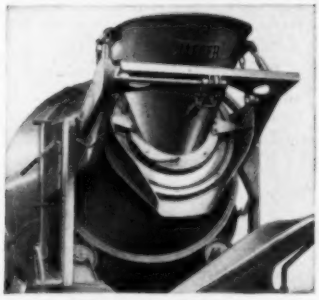
Up to 1200 lbs. lighter than previous models





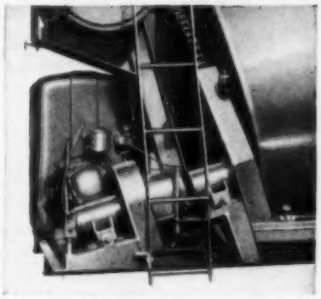
Open-type end loader with instant-opening drum gate

Prevents cement blow-back or water spillage when charging and loss of concrete even on steepest grades.



Sealed end-loader with perfected grout-proof seal

One quick wheel-turn fully opens hopper. One push of lever lubricates and completely flushes the seal.



"Comatic" transmission gives hydraulic finger-tip control of drum

Power does the work. Automatic brake prevents shock load to transmission gears when reversing drum rotation.

You can mount Jaeger "MIX PLUS" models on any standard make of truck, haul the largest legal payload, charge, mix and discharge faster than with any other truck mixer, and continue to enjoy these advantages throughout a life expectancy of 8 to 10 years compared with the 4 to 5 years average life of cheaply built mixers that cost as much or more to buy. That's why more concrete continues to be mixed and hauled in Jaeger truck mixers than by any other method.

For full information see your Jaeger distributor

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

***World's largest builders of* TRUCK MIXERS, AGITATORS • PUMPS • COMPRESSORS • CONCRETE MIXERS • PAVING MACHINERY**

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1—Chimney block mold includes two types of pilaster block fittings

1—28 cubic foot Stearns Mixer

1—28 cubic foot Stearns Skip-Hoist

47—Model 72 steel racks

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Complete Equipment For Making 3,000 Concrete Blocks Per Day

All equipment in first class condition and ready to operate.

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Sarasota, Florida

DUNBRIK machine in excellent condition, over 3000 brick pallets, pallet dunker, brick carts, jack lift, jumbo brick attachment, spare parts. All for $2,900.00, cash FOB Olean, New York.

I. W. MILLER & SON, INC.
330 Coleman Street
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UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

SPACE HEATERS

War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.

—Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish with each heater.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
14 No. Clinton St.,
Chicago 6, Illinois

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SHOVELS & CRANES

Bay City "25" Used ½ yd. Dragline @ $5500.00
Insley "K-12" Used ½ yd. Dragline @ $6500.00
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Jaeger 3 yd. Used Hi-Discharge Transit Mixer, w/White WA-26 @ $3000.00
Jaeger 3 yd. Used Hi-Discharge Transit Mixer, w/White WB-22 @ $3500.00
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Universal Port. Pulverizer Plant: #5 Pulverizer, Murphy "ME-66" diesel power, plate feeder, 4 x 8 screen, etc. Pneumatics @ $17,500.00
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EIGHMY EQUIPMENT COMPANY
120 S. PIERPONT ROCKFORD, ILLINOIS

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Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by
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REBUILT JAEGER DRUMS

Two—Model 2HC (1950-51) bare drums with mixing blades. 75-80% of usable life. Perfect condition. Trunnion rings thoroughly reinforced.

Contractors Machinery Company
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1—Model A Stearns Clipper in perfect condition with gearhead motor, 8" and 4" attachments. **Contact Mr. Wyrick Juhan, P. O. Box 625, Glenwood Springs, Colorado.**

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer—yet cost considerably less. Write for prices.
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Conveyors

Elevate: SAND • GRAVEL REDI-MIX CONCRETE

SEND FOR CATALOG
NEW LONDON ENGINEERING COMPANY
New London, Wisconsin

FOR SALE

1—2 yard Smith concrete mixer
1—2 yard Jaeger mixer
1—3 yard Rex mixer
all need some work, will sell cheap.

READY MIXED CONCRETE CO.
P. O. Box 312 Wausau, Wisconsin

STOP *that* WATER

With FORMULA NO. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE
READY-MIX CONCRETE PLANT
& SAND-GRAVEL WASHING PLANT

Includes: 2 story bldg. 40 x 70, 7 rm. modern living quarters—2—3 yd. mixers, 1—3 yd. mixer, 5—dump trucks—"Cat" end loader, lathe, fuel pump, 2 river pumps, office equipt., etc.

Located 35 miles west of Chicago.

(S&G wash plant can be used separately)

Entire price—$75,000; gross $65,000; net $24,000.

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No. 7 Joltcrete with Agitator, Power Carriage, Offbearer, with 8, 4, 6, 10, and 12 inch attachments. 2000—8 inch, 2500—4 inch, 2000—6 inch, 1500—10 inch, 1000—12 inch pallets. 60 Racks. All equipment in A-1 shape. Will sell as a unit or separately.

OLSEN SALES COMPANY
ROCK RAPIDS, IOWA
PHONE 351

MINERAL COLORS

for

BRICK MORTAR STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

100,000
PRESSED STEEL PALLETS
In Stock

Send tracing or pallet for quotation.

GENERAL CONCRETE EQUIPMENT CO.
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FOR SALE

1 Stearns #15 3 Block Machine
Damaged by Fire
$1500.00

The Crume Brick Company
P. O. Box 4, Far Hills Station
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CONCRETE MANUFACTURER CLASSIFIED SECTION

FOR SALE

Stearns Jolterete No. 7 Block Machine complete, in good running condition—elect. switch boxes, extra vibrator motor—two 8" mold boxes & pressure heads—one 4" mold box & pressure head—pressure heads for 8" corners, sash, pilaster and bull nose blocks—cores & pressure heads for 8" halves in commons, corners, sash and bull nose—4200 4" steel pallets—2900 8" steel pallets—450 8" corner pallets—200 8" sash pallets—150 8" pilaster pallets—600 8" half pallets for commons, corners, sash, bull nose,—check plates & attachments for 8" bull nose—both round & single round corners—one Stearns Hydraulic Off Bearer—all cleaned & ready for immediate use. **Phone or write Frederick G. Smith & Company, 327 E. Stephenson Street, Freeport, Illinois. Phone Main 3700.**

FOR SALE

1—Appley-Yellen Vibrating—2 block Machine
1—7½ H.P. Ingersoll-Rand Air Compressor
2—14 cu. ft. Motor Driven Blystone Mixers
1—Clark Platform Lift Truck
2—2-roll Crusher—Bonded Scale Machine
1—Air-lift Off Bearer
3000—8" Alum. Die-Cast Pallets
64—8" Alum. Die-Cast Steel Sash Pallets
1250—4" Alum. Die-Cast 3-cell Pallets

We will sell the above either complete or separately.

EAST SIDE CONCRETE SUPPLY CO.
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HELP WANTED

EXCELLENT OPPORTUNITY WITH ESTABLISHED COMPANY FOR SUPERINTENDENT AND FOREMAN EXPERIENCED IN MANUFACTURING CAST AND MACHINE MADE CONCRETE PIPE. STATE AGE AND EXPERIENCE. SALARY OPEN.
UNITED STATES CONCRETE PIPE COMPANY
1500 Union Commerce Bldg., Cleveland 14, O.

WANTED — TOP PRODUCTION MAN

to operate concrete and cinder block plant in metropolitan area; Besser equipment; state qualifications, experience, references and salary expected. Job open now. Reply to:

BOX NO. Y-20, c/o the Concrete Manufacturer
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BARGAIN OF A LIFETIME
STEARNS 15

Stearns 15 PLAIN PALLET BLOCK MACHINE complete with 8 in. and 12 in. mold boxes, and magnetic offbearer pallet return. Less than 4 years old. Excellent condition. Can be seen in operation for a limited time only. Location: Cleveland, Ohio.

For Full Details
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GENERAL ENGINES COMPANY, INC.
307 Hunter St., Gloucester, N. J.
Phone: Gloucester 6-1337

BLOCK PLANT EQUIPMENT FOR SALE
PRACTICALLY NEW
FOR CASH ONLY

L-5 Lith-I-Bar 3 Block Machine
40 foot Des Plaines Mixer
33 #72 Block Racks
800 Steel Pallets
Model E C-25 Jaeger Air Compressor with tank
Model D Truckman with 54" platform

All equipment bought new fourteen months ago. Used one shift operation since. In operation now and may be inspected. For details write to:

VETERAN BUILDING BLOCK CO.
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BESSER SUPER VIBRAPAC
FOR SALE

900 blocks per hour, power side pallet return magnetic offbearing hoist
40 cu. ft. BESSER MIXER
140—72 Block Racks

All in good condition—can be seen in operation.

Available 60 days.

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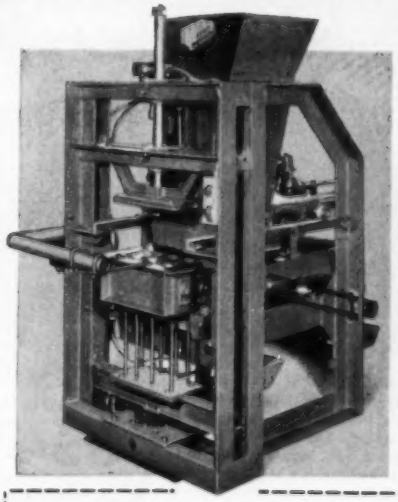
The BACKBONE of a THRIVING BLOCK BUSINESS

for a Comparatively Small Investment in the

KENT STANDARD BLOCKMAKER



Yes, we are ready to prove to you that the KENT STANDARD BLOCKMAKER will give you BIG OPERATOR advantages for a comparatively low investment.

It will enable you to sell against stiff competition and one operator alone can run this semi-automatic machine, producing up to 5 or 6 smooth topped blocks per minute from any aggregate—and at a low cost per block.

Labor and material costs continue their upward spiral. You can help "lick" this problem by installing one or more KENT BLOCKMAKERS.

Get full particulars by writing us today.

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO
Manufacturers of
CONCRETE PRODUCTS MACHINERY SINCE 1925

Send Blockmaker Literature to

Name _____
Address _____
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Complete Satisfaction

Ask the men who use them . . . and they'll tell you that Dixon Concrete Pipe Machines are the fastest pipe makers, the biggest money makers in the business. The records speak for themselves.

(Illustrated) Dixon Model "C" Hydraulic Pipe Machine, for 4" to 18" B & S; 6" to 18" T & G 3 and 4' Joints Adaptable to 18" grease traps. Write for complete information.

". . . it has given trouble-free performance."

". . . we are more than pleased and can speak only too high for your equipment."

". . . we can produce more tons, per man, on your machine than any competitive one we know."

". . . off-bearers can not keep pipe away from the machine."

". . . Men come from other plants to work on the Dixon machine."

". . . no pipe failures in four years . . ."

Names of these enthusiastic users of Dixon Pipe Machines will be furnished upon request.

HOUSTON CONCRETE MACHINERY CO.

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Manufacturers of:

Dixon Concrete Machinery

Dixon Pipe Machines	Septic Tank Forms
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GENERAL MIXER! SAVES YOU MONEY

Solid ¼ steel plate construction. Heavy end and bowl replaceable liners (Ni-Hard liners available at extra cost). Easily adjusted paddles. Safety screen. Ruggedly designed to take a beating. Shipping weight 2,300 lbs. Also 21 and 30 cu. ft. sizes. Write for free bulletin.

1 BAG 15 CU. FT.
$654.50
LESS MOTOR-F.O.B PLANT
SHIPPING WEIGHT
2,300 LBS.

GENERAL ENGINES CO.

DEPT. Q-112—307 HUNTER STREET, GLOUCESTER, NEW JERSEY

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- ☐ Air Compressors
- ☐ Air Entraining Agents
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- ☐ Batchers
- ☐ Batching Plants
- ☐ Belting (Rubber)
- ☐ Bin Gates
- ☐ Bin Level Controls
- ☐ Bins and Batching Equipment
- ☐ Blades, Masonry Saw
- ☐ Block and Brick Machines
- ☐ Boilers
- ☐ Bucket Loaders
- ☐ Buckets, Concrete
- ☐ Buckets, Elevators
- ☐ Buggies, Concrete
- ☐ Bulk Cement Handling Equipment
- ☐ Bulk Cement Storage Plants
- ☐ Calcium Chloride
- ☐ Car Pullers
- ☐ Colors, Cement and Mortar
- ☐ Conveyors, Belt
- ☐ Conveyors, Portable
- ☐ Conveyors, Screw
- ☐ Curing Agents
- ☐ Curing Equipment
- ☐ Cutters, Bar
- ☐ Dispersing Agents
- ☐ Flooring Systems
- ☐ Forms, (Pipe, Joist, Ornamental, etc.)
- ☐ Guns, Color Spray
- ☐ Hardening Agents
- ☐ Heaters, Concrete Mixer
- ☐ Hoisting Equipment, Concrete
- ☐ Hoppers
- ☐ Joist & Slab Machines
- ☐ Kilns, Curing Concrete
- ☐ Lift Trucks, Electric
- ☐ Lift Trucks, Gasoline
- ☐ Lift Trucks, Hand
- ☐ Lightweight Aggregates
- ☐ Meters, Entrained Air
- ☐ Meters, Water
- ☐ Meters, Sand Moisture
- ☐ Mixers, Concrete (Batch)
- ☐ Mixers, Concrete (Continuous)
- ☐ Mixers, Truck
- ☐ Mixing Plants, Central
- ☐ Molds, (Pipe, Joist, Ornamental, etc.)
- ☐ Off-Bearers
- ☐ Paints & Coatings, Concrete
- ☐ Pallets
- ☐ Pipe Machines
- ☐ Pumps, Concrete
- ☐ Racks, Curing (Concrete Masonry)
- ☐ Recorders, Concrete Batching
- ☐ Regulators, Temperature
- ☐ Reinforcing Equipment
- ☐ Sand-Lime Brick Machinery
- ☐ Saws, Masonry
- ☐ Scales
- ☐ Silo Stave Machines
- ☐ Silos, Storage
- ☐ Skip Hoists
- ☐ Skip Loaders
- ☐ Testing Equipment
- ☐ Tile Machines, Drain
- ☐ Tile Machines, Roofing
- ☐ Tractors
- ☐ Truck Bodies, Ready-Mixed Concrete, Non-Agitating
- ☐ Turntables
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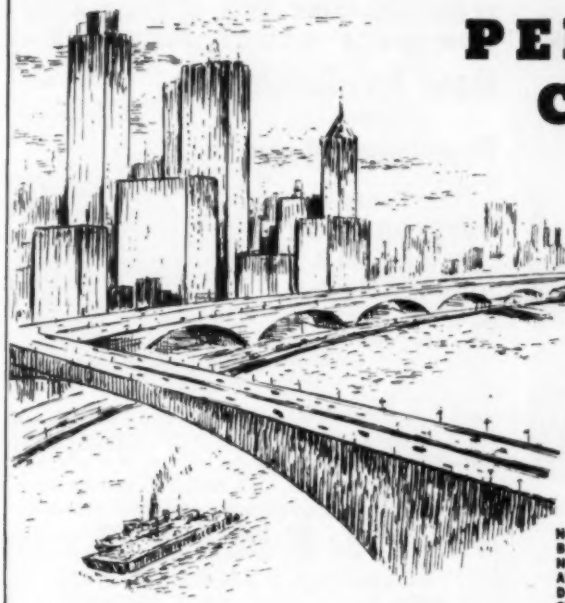
CITY ..... STATE .....



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Smoother, thicker, more uniform

MARVEL DRAIN TILE

...now made on the MARVEL JR. Concrete Drain Tile Machine

S-T-R-E-T-C-H your Investment Dollar!

Concrete plants everywhere are making extra profits from this sturdy, low-cost, reliable unit.

MARVEL JR. economically produces smooth, flat-ended, symmetrical drain tile—a "big demand" item for your market.

Write NOW for bulletin on this sure-fire money-maker.

Ask about our durable and accurate aluminum molds.

CONCRETE MACHINERY CO., Drawer 60A, Hickory, N. C.

COLORS

SYNTHETIC CONCENTRATED

RED

YELLOW **BLUE**
GREEN **BROWN**

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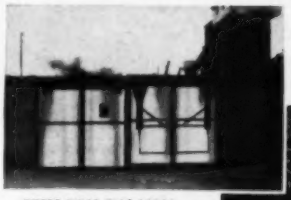
Color Card on Request

REICHARD-COULSTON, Inc.

15 E. 26th St., New York 10, N. Y. Factory Bethlehem, Pa.

SAVE FUEL • REDUCE CURING TIME • CUT COSTS • UP PROFITS with *Standard* KILN DOORS!

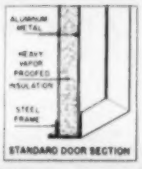


WHERE AISLE SPACE IS LIMITED
The sliding carrier-type door needs no aisle space. Carrier equipment requires 15 inches minimum clearance above top of doors.

WHERE HINGE-TYPE DOORS ARE PREFERRED
The hinge-type door is pulled up by a chain hoist. It can be used when there's insufficient room at sides of door opening to permit using the carrier-type door, and where aisle space is adequate.

CHECK THESE FEATURES

- √ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.
- √ Rugged Steel Frame.



STANDARD DOOR SECTION

Get the Best — Send for Details Now

STANDARD DRY KILN COMPANY

P. O. BOX 5708 • INDIANAPOLIS, INDIANA

There's an extra market for masonry units in

CONCRETE BLOCK JOIST FLOORS

The popularity of concrete block joist floors for buildings with light floor loads is rapidly increasing. Such floors are easy to build. They also are sturdy, durable, economical and firesafe.

One of the best ways to develop this "extra" market is to promote sound construction practices. You'll find it's good business to make frequent calls at job sites—encouraging builders to follow these simple steps:

1. Build exterior wall to the height of a floor, including one course of 4" solid concrete block.
2. Erect formwork of parallel planks for supporting filler units and concrete slab.
3. Lay rows of block on planks, with cores running horizontally. Joints between block in adjacent rows may be staggered or continuous.
4. Install reinforcing bars for cast-in-place joists as per design table.* Place conduits for wires, ventilating, plumbing and heating.
5. Set a continuous strip of 1" waterproof insulation board—as deep as the floor is to be—around the outside edge of the floor.
6. Place concrete for joists and slab and moist cure 5 to 7 days. The floor is an ideal base for any finish desired. The flat underside can be painted, plastered or left exposed as desired.

*Write for helpful free booklet on design and construction of concrete block joist floors. Sent only in United States and Canada.

PORTLAND CEMENT ASSOCIATION

Dept. 11-58, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

It's **FLEMING** *for High Quality—Low Cost!*

FLEMING FMC-180 AUTOMATIC CONCRETE BLOCK MACHINE—

Now Available *WITH* **Pressure Head***

Pressure Head Operates Automatically

Combines **PRESSURE with high speed VIBRATION**

The FMC-180 Plain Pallet Vibrator using "WOOD" or Steel Pallets is a 180 block per hour producer of the finest smooth finish, uniform and dense heavy or light weight blocks.

Complete range of block sizes and shapes available.

* The Pressure Head attachment is supplied as optional equipment with the FMC-180 and is especially recommended for operation with light weight aggregates.
(Fits FMC-180 Machines Now in Use)

Complete Concrete Block Plants engineered to your individual specifications.

FLEMING MANUFACTURING CO.

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Phone 400

COMPLETE CONCRETE BLOCK PLANT EQUIPMENT

TAKE STEPS *NOW* **to make LARGE PROFITS from a SMALL INVESTMENT**

PATENTED

Pre-cast Concrete Steps

These easy-to-make, attractive steps find a ready market everywhere.
DON'T WAIT — INVESTIGATE!
A Real Business — Not a Side Line
Exclusive Territories available — Write for details.

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Advertise Your

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DUR-O-WAL

TRUSSED Design

ARCHITECTS everywhere are hailing the economy and performance of time-tested, custom-designed Dur-O-waL . . . the steel reinforcing member that gives masonry walls a backbone of steel.

the Quality plus the Gross Area of the Steel will alone determine your Net Results

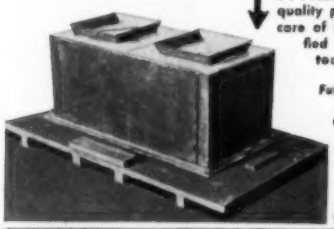
Strength comparison

	Area	Strength
2¾" Round Rods—55,000 lbs. steel	.0982	5401 lbs.
Standard Dur-O-waL—3 No. 9 Rods, 100,000 lbs. steel	.0518	5181 lbs.
Extra Heavy Dur-O-waL—2-3/16" Rods, 1 No. 9 Rod, 100,000 lbs. steel	.0724	7247 lbs.

With this strength comparison PLUS the added mechanical bond provided by the unique triangle construction and the high tensile strength steel provided in a small area, it is easy to see why Dur-O-waL is the reinforcing member to specify for buildings you design. Cedar Rapids Block Co., Dur-O-waL Div., 655 12th Ave., SW, Cedar Rapids, Ia.; Dur-O-waL Products, Inc., P. O. Box 628, Syracuse 1, N. Y.

"SURE SHOT" METHOD

yields Top Profits in making Septic Tanks



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Tank Forms and Handling Equipment insure faster pouring . . . stripping . . . handling . . . resetting . . . AND a high-quality product. One man takes care of deliveries. Many satisfied customers from coast to coast.

Full details on request

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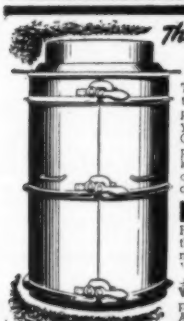
RICHMOND 23, VA.



The "Quinn Standard" FOR CONCRETE PIPE

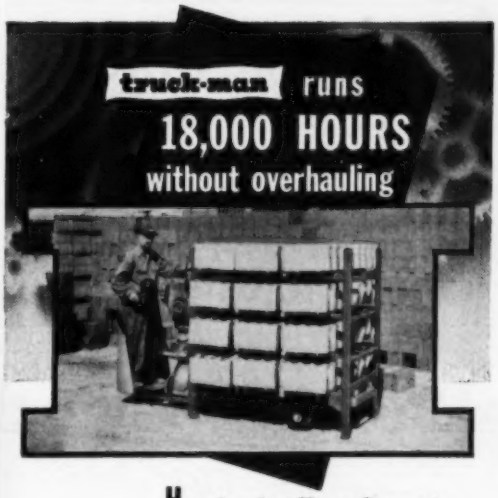
The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from "0" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers QUINN CONCRETE PIPE MACHINES.

QUINN WIRE & IRON WORKS 1627 12TH ST. BOONE, IOWA



Here's what Knox Concrete Products, Inc., Knoxville, wrote us when they placed an order for replacement parts recently:

". . . We are not only well pleased but we do not believe there is a piece of equipment on the market which would serve our requirements any better . . . Our normal load would probably run in the neighborhood of 4000 lbs. . . . We now have four Truck-Men . . . that run possibly *20 hours every day continuously* . . . The cost of operating a Truck-Man is certainly extremely low, as it uses very little gas and oil . . . We have had very little maintenance on this equipment."

". . . After six years at approximately 10 hours per day steady running I find it necessary to rebuild the majority of gears, sprockets and other movable parts on one Truck-Man and prepare to do so on another . . ." says Cement Block Industries, Coral Gables, Florida.

What more need we say? That last statement works out to approximately 18,000 hours of trouble-free operation. What would the record show if they had been using the *new* Truck-Man with its husky 5.8 h.p. Wisconsin engine? It's Truck-Man's low weight to payload ratio combined with rugged power that makes possible its unequalled efficiency in block-plant operation. You burn only a gallon of gas on most 8-hour shifts yet spot the heaviest racks in jig-time. Rubber cushioned ride, hydraulic lift, smooth start and stop mean no costly checking of blocks. Lower costs from purchase through maintenance and big savings in manpower—everyday—for years—make Truck-Man your *first* necessity for block handling. Available in skid, pallet, platform and *New* tractor models.

Send for full details in our new 1952 catalog.

truck-man Div. of The KNICKERBOCKER CO.
571 Liberty Street • Jackson, Mich.

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Title_____

Address_____

City_____ Zone____ State_____

Good-bye Forever

to BRAKE COIL BURNOUTS

M&M Brake Coils

for Stearns Magnetic Brakes are

Guaranteed

Burnout Proof

Eliminate down time changing burned out brake coils

Another First for

M&M ENGINEERS

Write today, giving coil number and voltage

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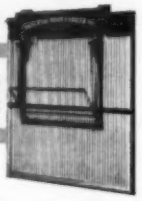
INDIANAPOLIS, INDIANA

M&M ENGINEERING CORP.

BETTER KILN CLOSURES

Universal Door and Carrier equipment in use at Superior Concrete Products Co., Augusta, Ga.

● Can help you cut your cost per block and improve your quality-uniformity—by stopping costly losses of heat and steam—and preserving uniform temperature and humidity. Two *very* good reasons for you to investigate



UNI-TEMP insulated all-metal DOORS* & UNIVERSAL world-famous DOOR CARRIERS

**Doors also furnished hinge-mounted.*

Let us give you full information about the most efficient kiln closure equipment you've ever seen—at a cost that is probably *much* less then you expect!

Write, wire or phone: UNIVERSAL DOOR CARRIER, Inc.
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NOW MORE THAN **130** LICENSED MANUFACTURERS *Producing*

Patented
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A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

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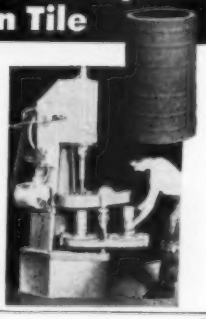

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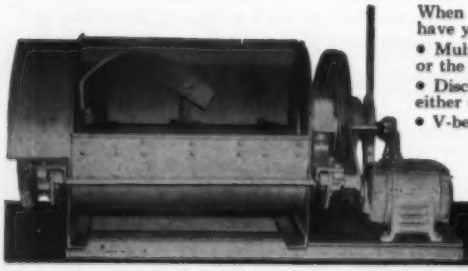

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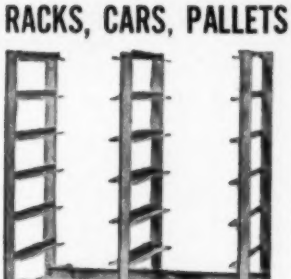

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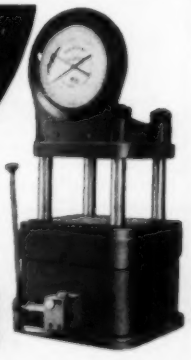

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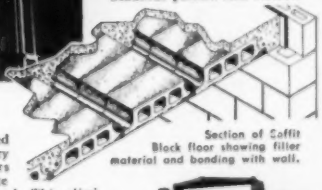
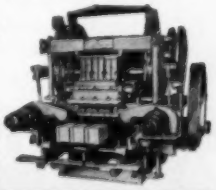


Section of Soffit Block floor showing filler material and bonding with wall.

Soffit Block are supported in place with temporary adjustable steel centers while reinforced concrete slab is placed and cured. This eliminates timber shoring and leaves space below clear during construction.



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September 4, 1952

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As a result of this last purchase, our production has increased to 1,600,000 units per year, including concrete and cinder blocks and bricks in all sizes and shapes, which are more uniform and compact than ever before. Our block production averages 1000 per hour.

We can honestly report that through the use of the great, new, one-man Stearns 15 our business has increased 12 times over past years.

Our employees' list has grown to 10 men, and the radius of business served averages 25 miles, though we have also supplied block for construction in many parts of the Thumb district to the north.

Other Stearns machinery in our plant includes a mixer and a skip loader.

We have found our association with Stearns to be a pleasant and a profitable one, and we highly recommend your excellent machinery and your parts service to any one who wants to get ahead in the concrete block business.

Yours very truly,

Charles Lorenz
Andrew Tait
Partners

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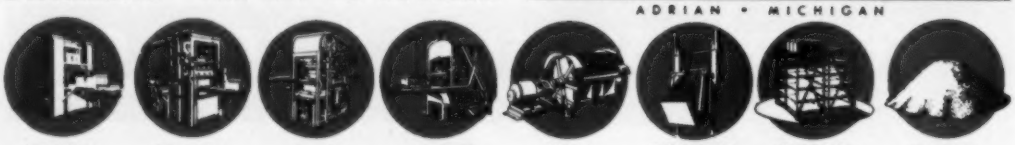

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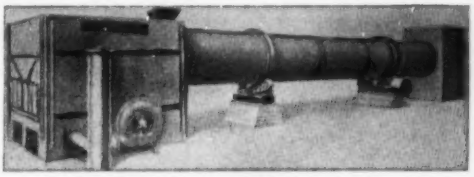

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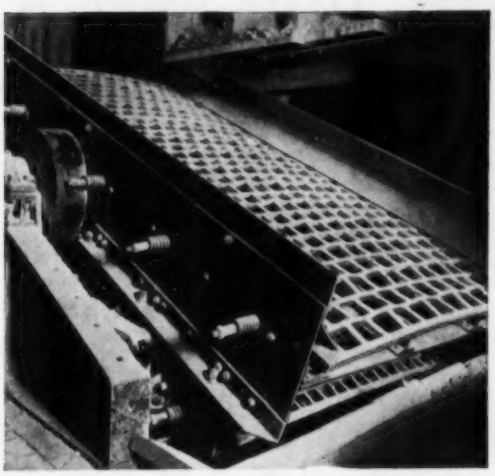

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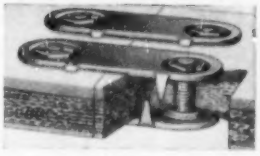

Compression Grip distributes strain over whole plate area

★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

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Model "S" — ½ yard shown at right. Model 38 ⅜ yd.

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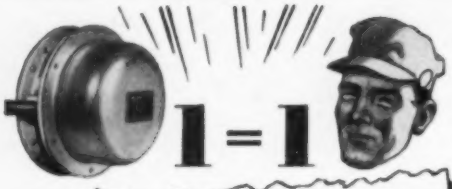

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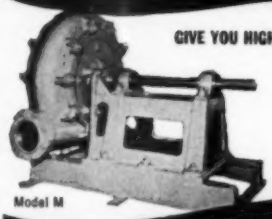

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Lightning Semi-Heavy pumps deliver against 90-ft. heads, pump 9 yds. an hour from 3-in. size. Also 4, 6, 8-in. sizes. Lightnings have the lowest first, replacement and operating costs of any pump built. Write for information.

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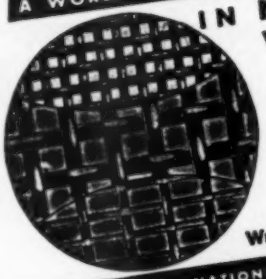

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RELIANCE Crushers are especially suited for this job—featuring rugged all-steel construction, low and large receiving openings, and long deep jaws for sure gripping and crushing. Jaws adjustable for fine or coarse product.

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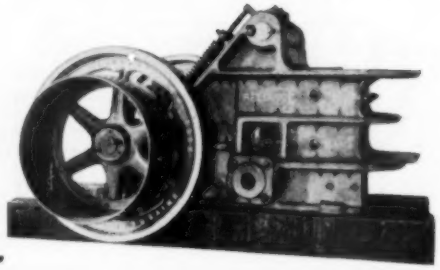

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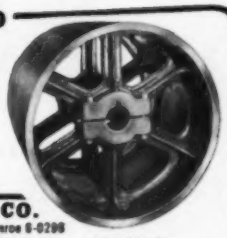

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2—Additions for sub-deck with four mesh regular steel of .063" diameter wire, backing cloth, clamping plates, bolts, etc.
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1—40 H.P. Westinghouse motor 575 RPM Full load, 3/60/440 volts, drive for the Rod Mill.

This unit is still in operation and will be taken out of service due to a change in production methods.

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20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
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251 Electric Motors, all 3/60/220 V, ½ HP to 100 HP.

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66 Gear Reduction Units.

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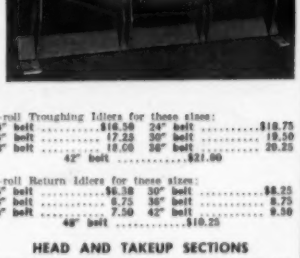

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14" belt	$16.50	24" belt	$18.75
16" belt	17.25	30" belt	19.50
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24"	4	1/8"	1/32"	28 oz.
30"	4	1/8"	1/16"	32 oz.
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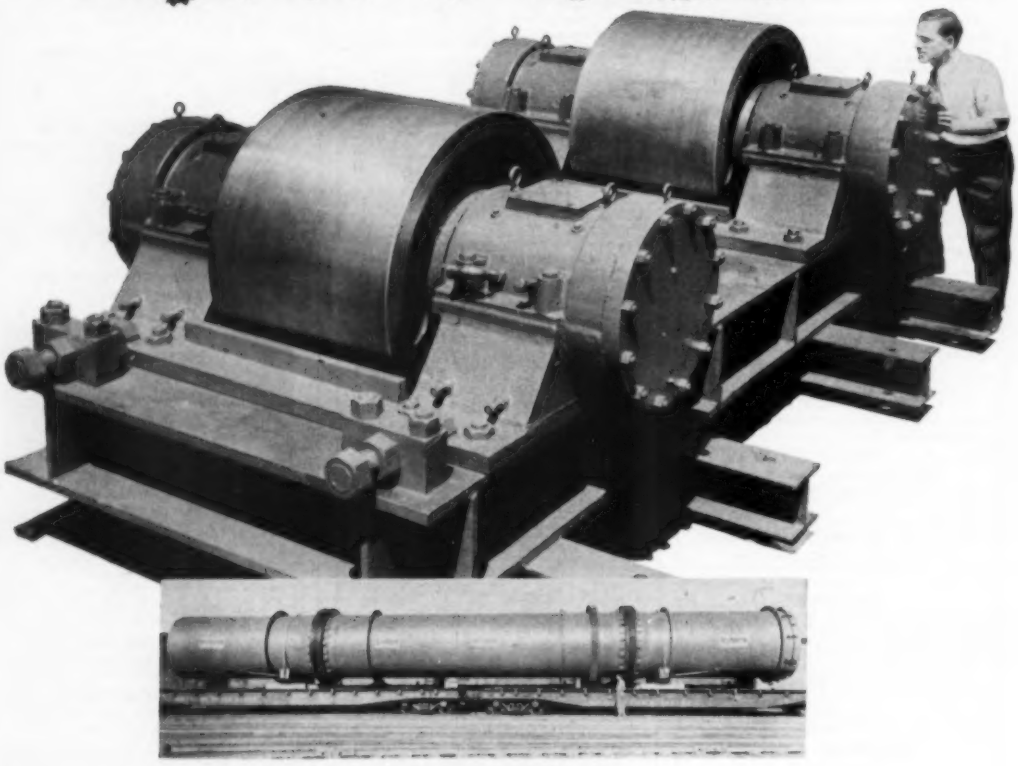

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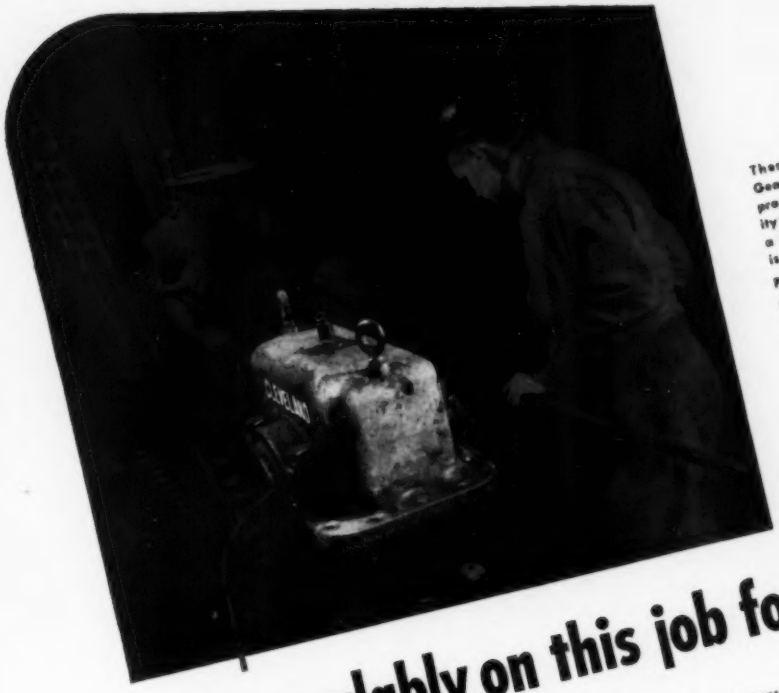

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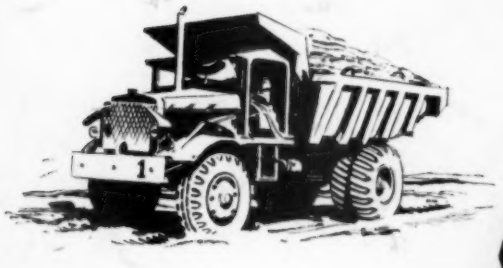

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